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WEEKLY

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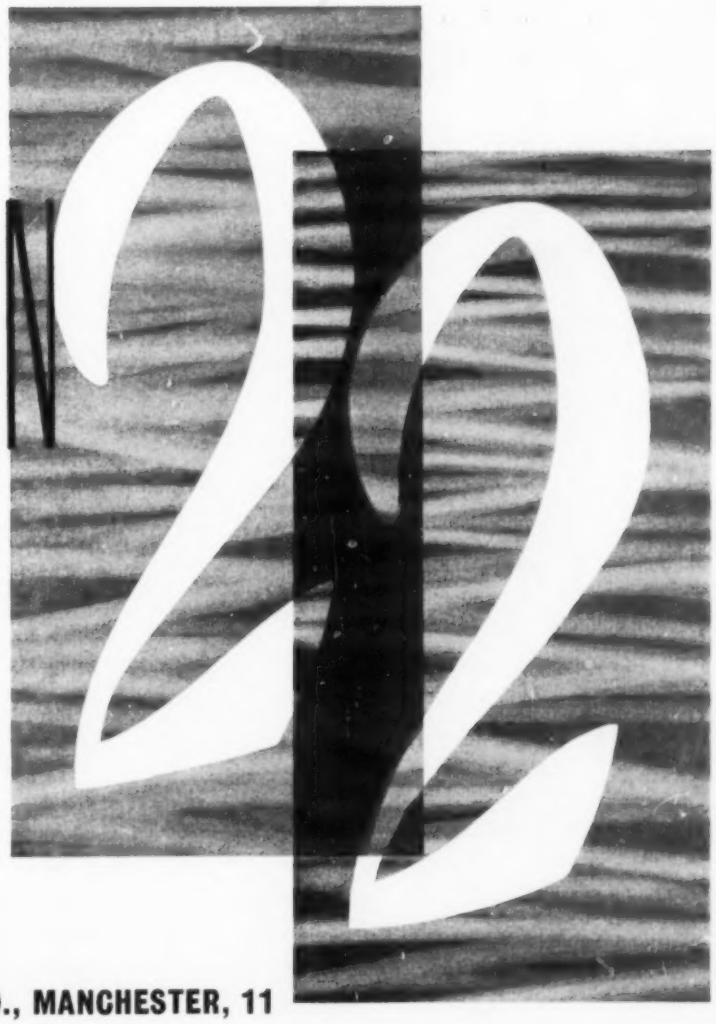

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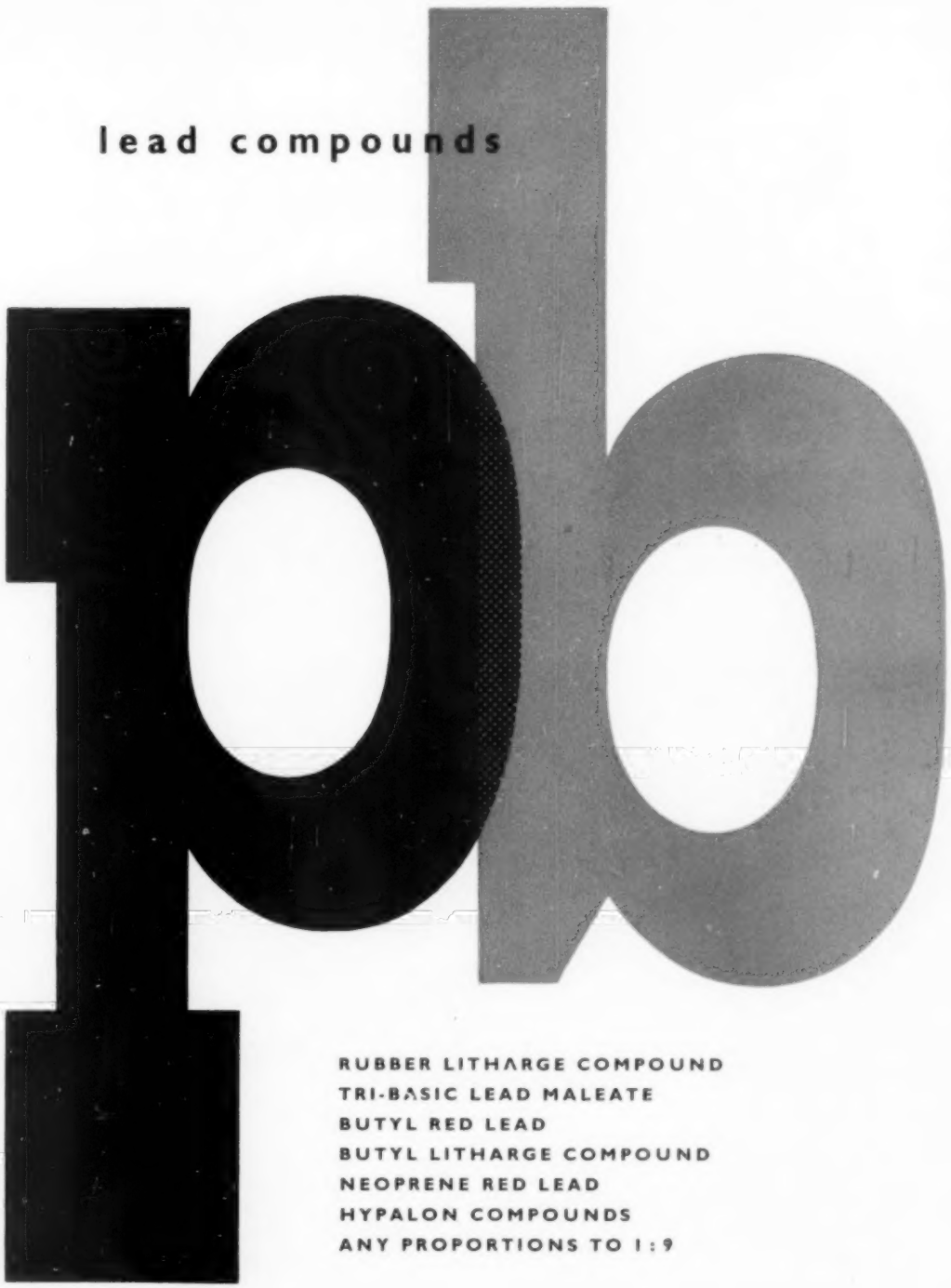

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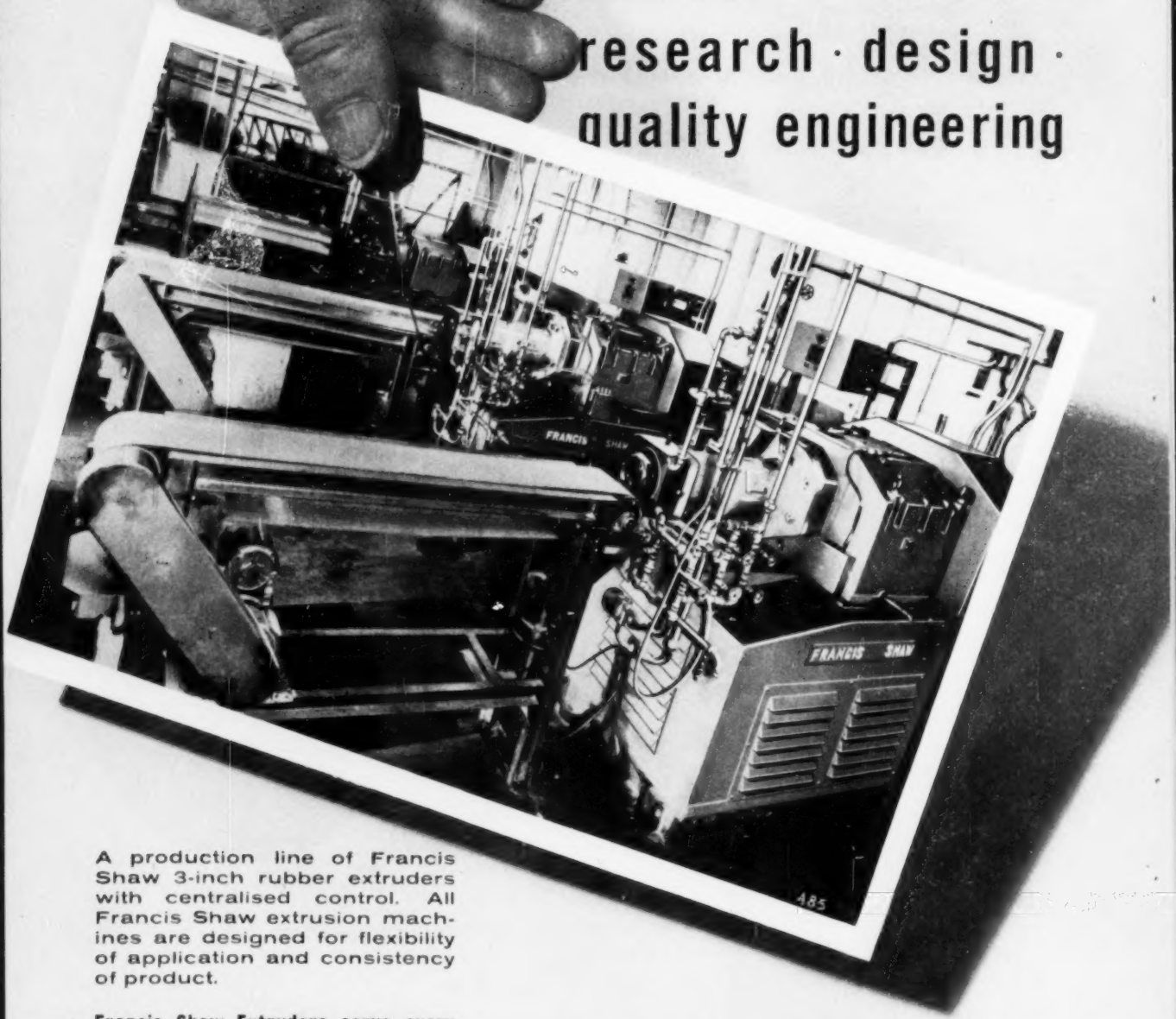

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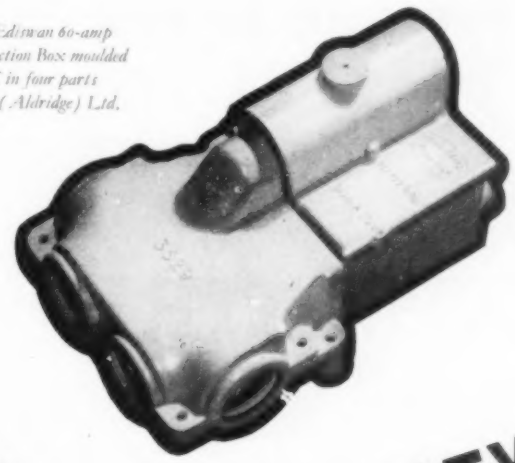

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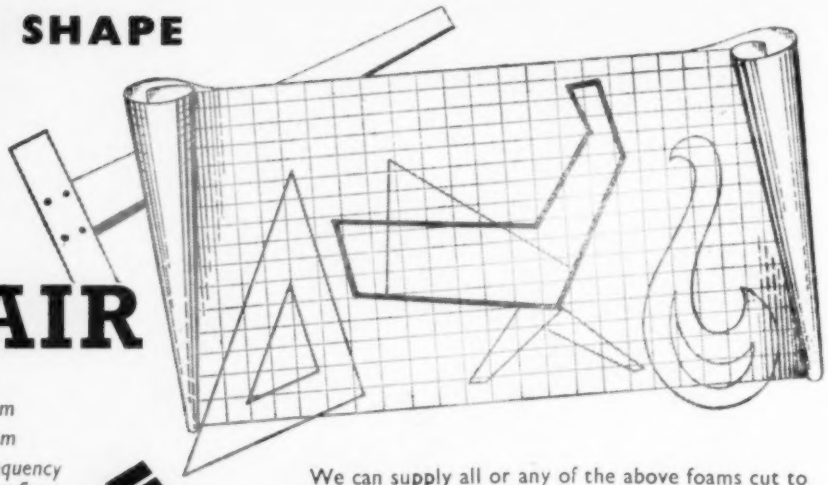

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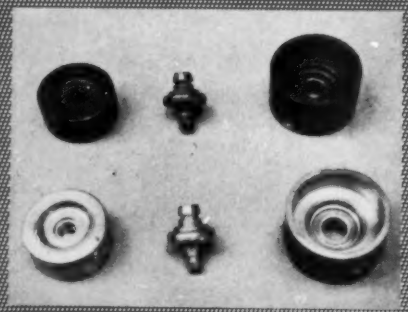

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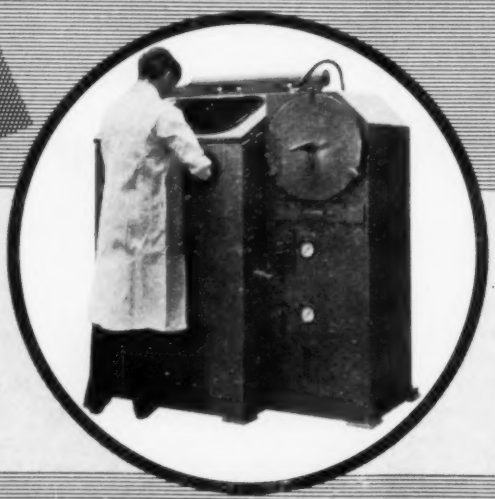

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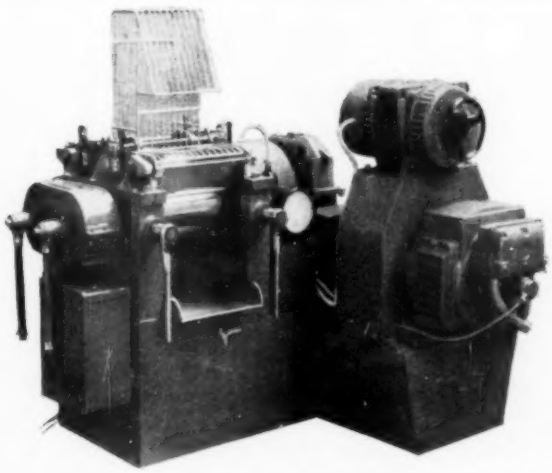

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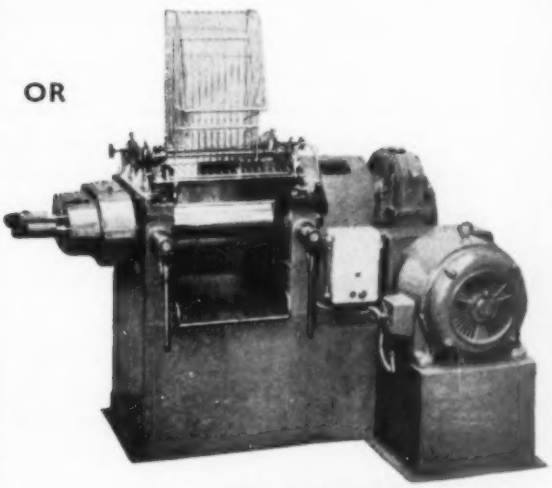

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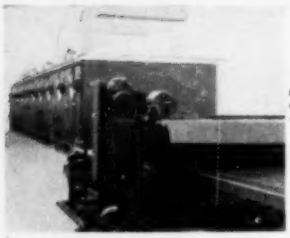

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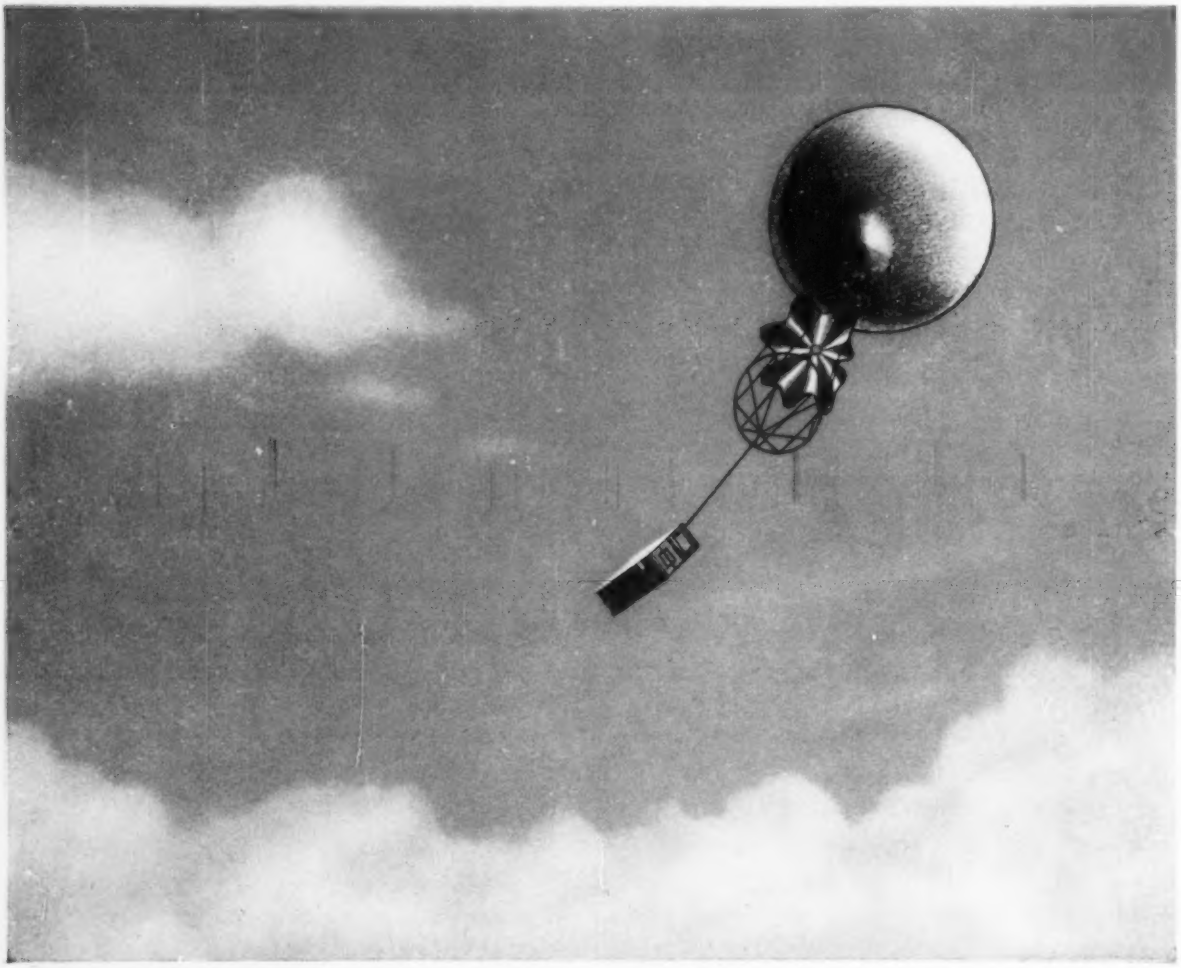

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RUBBER JOURNAL AND INTERNATIONAL PLASTICS

One shilling — WEEKLY

Volume 140 — IN ITS 77th YEAR — No. 1

January 7 1961

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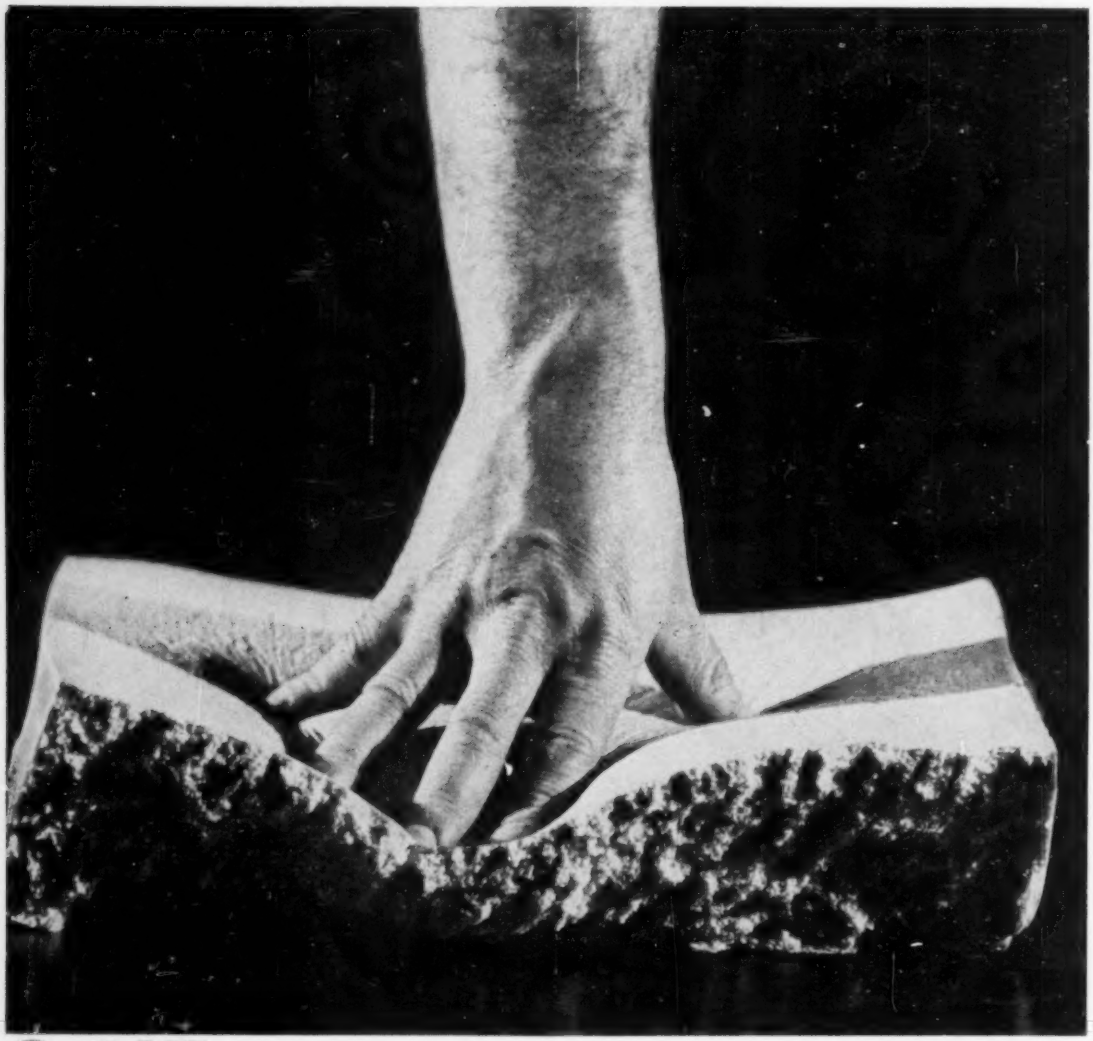

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NOTES of the WEEK

The Shortage of Technicians

FIGURES published by the Ministry of Labour on the shortage of technicians will come as no surprise to employers in the rubber and plastics industry. According to a survey conducted early last year by the Ministry, employers in the chemical and engineering industries as a whole forecast that the total demand for technicians in January, 1962, would be about twice the January, 1960, number of vacancies. This means that, by January, 1962, 16% more technicians will be needed by the two industries than they had a year ago.

Industrialists in the polymer industry have been aware of this position for some time, but it is not until we see the figures down in black and white that we realize how serious the problem is. The shortage of technicians is actually greater than that of scientists and engineers—although the latter shortage has received more publicity.

The survey covered 400 firms employing about 22% of the labour force in engineering and chemicals. Nearly 18% of their workers had managerial, administrative or clerical jobs, and 71% were craftsmen, semi-skilled or unskilled workers. About a third of all the technicians surveyed were employed in design and drawing office work, which accounted for 41% of the vacancies. The next largest demands were for laboratory technicians and for technicians employed in testing, inspection and analysis.

Looking at the Ministry's definition of technician gives us another cause for concern; 59% of the technicians surveyed had no qualifications—although this figure included workers who had completed a craft apprenticeship. We think this country produces many good technicians—some of the best in the world—but during this post-war period there has been a tendency to use the word technician to describe anyone who can screw on a nut or light a bunsen burner. Paper qualifications, in themselves, are not everything, but the acquisition of them is a valuable supplement to practical experience.

As we go to press a White Paper on technical education is due to be published. We hope that this will contain some solutions which will help to close the gap between the supply of technicians and the demand—both as regards quantity and quality.

Communication

AS an organization grows, so does the problem of communication within it. Communication between management and workers, between head office and branch office, even between department and department is adversely affected as the organization expands its interests and acquires fresh ones. One of the factors that can help to keep such a growing concern together is a house organ. It may cost little to buy, it may be referred to affectionately as the 'works' rag,' but every page plays a part in combating the 'cog in a machine' feeling and in establishing better personnel relations generally. It can be a valuable medium for explaining management policy, and for giving the whole story of a product to a person who is responsible for producing only a part of it. And, as Lord Crook, president of the British Association of Industrial Editors, has said: 'Managements derive at least as much information about their workers as employees do about their firms.'

As befits an industry where growth is commonplace, the polymer industry has an excellent army of house organs, ranging from small publications to the *I.C.I. Magazine* with its circulation of 80,000 copies. The latest recruit to this is *London Image*, the staff magazine of the London Rubber Co. Ltd. and its subsidiaries, the first issue of which has just been published. London Rubber is the largest manufacturer of dipped latex products in Europe, and the third largest in the world. The company, which began in one room 45 years ago, has grown to such a size that it now uses half a million gallons of latex a year and, to quote from the magazine's foreword, 'it is no longer possible for many people to know each other personally. . . . We hope that the magazine will do something to reduce the lack of contact and to provide a connecting link between the various establishments.' From the first issue the link certainly looks like being a strong one.

. . . *And Now the 1962 Awards*

THIS year, for the first time, the New Year Honours List contained awards presented for services to our export trade. One such award—the C.B.E.—has gone to James Scott who is the sales director of Crompton Parkinson. He assisted in negotiations which led to the UK consortium Rustyfa receiving the £15m. Dniepropetrovsk tyre factory order from Russia. The news (reported elsewhere in this issue) that British Insulated Callender's Cables has received a Canadian contract worth $7m., should, we think, make the choice of at least one of the 1962 Honours List 'export' awards an easy matter. This contract, for a flexible pvc/steel pipeline, which was gained in full competition with American and Canadian interests, is a really first-class start to our industry's 1961 export trade.

NEWS *Briefs*

USSR LOAN TO CEYLON—FRENCH BLACK PLANT
JAPANESE PVC AND PETROCHEMICAL PROJECTS
HUNGARIAN PLASTICS—INDIAN CONSUMPTION

●**Holland** — A bid of 180% for the shares of the Amsterdam Commercial Association has been made by the Amsterdam Rubber Company against a stock market price of 149%. The Amsterdam Commercial Association, formerly the Amsterdam Cultural (Plantation) Association, is a holding company of shares in plantation companies formerly working in Indonesia and now active in the commodity trade.

●**Ceylon** — According to Ceylon's Ambassador to the Soviet Union, G. P. Malalasekera, the Soviet Government has offered a 140m. rouble credit to Ceylon towards the execution of various projects contemplated under the country's ten year plan. These include a rubber and tyre factory.

●**India** — The demand for raw rubber in India, which is rapidly increasing, is likely to be 59,700 tons for 1961-62, according to the Rubber Board in Bombay. It is expected that the demand may reach as much as 93,800 tons by the end of 1965-66. At present about 7% of Indian consumption is met by synthetic rubber. The Rubber Board expects that by 1965-66 the pattern of demand will be 54,300 tons natural, 26,000 tons synthetic and 13,500 tons reclaimed.

●**United States** — World-wide use of rubber in 1960 was expected to have exceeded the record 3,688,000 tons of 1959, according to E. J. Thomas, chairman of the Goodyear Tire and Rubber. The Goodyear executive, like other rubber company representatives, also predicted continued record sales of replacement passenger car tyres in 1961. He said that such sales, which were thought to have totalled 69m. units in 1960, would rise to 71m. units in 1961.

●**United Kingdom** — There were no sales from the Board of Trade's stock of natural rubber during December 1960; 28,685 tons of rubber remain available for sale.

●**Holland** — Trelleborgs Gummifabrik AB, the Swedish rubber product manufacturers, is to build a £671,000 factory in Hoogezand, Northern Holland. Production of hardened rubber battery casings will begin in 1962. A Dutch subsidiary — Rubberfabriek Trelleborgs NV — is being set up.

●**United Kingdom** — Following P. B. Cow's expansion at Slough there have been changes in the company's structure. Various new subsidiaries have been formed and others renamed, and, as a result, the parent company will become a holding company with assets consisting of the capital of the subsidiaries.

●**Japan** — In order to overcome the shortage of calcium carbide a number of Japanese firms are said to be contemplating manufacture of PVC by the ethylene dichloride route. The firms are Japanese Geon, Mitsubishi Monsanto, Kanegafuchi Kagaku, Shinnippon Chisso and Kureha Kagaku (who already manufacture PVC), and Dainippon Celluloid, Nippon Petrochemical, Showa Denko, who are new to the field.

●**France** — The carbon black plant at Bec d'Ambes, Western France, is reported to be in full production. The plant, which uses natural gas from Lacq, went on stream in November.

●**Japan** — Mitsubishi Chemical Ind. Co. Ltd. is said to be planning to establish a petrochemical plant at Mizushima. Ethylene, propylene and butadiene are expected to be produced from the cracking of naptha fractions.

●**Hungary** — The chemical industry, which has 'absolute priority' under the five year plan, has itself given priority to a number of materials including plastics and synthetic fibres. Emphasis will be placed on the expansion and reconstruction of existing plants, and on improving the level of technology. Hungary's chemical industry is based on Szeged and is being developed along the river Tisza.

'Do you mind!'—518

US Rubber to Spend $53m.

BIG EXPANSION PROGRAMME INCLUDES UK LATEX PLANT

THE United States Rubber Co. will spend more than $53m. in 1961 to intensify its research and development and to modernize and expand its manufacturing and distribution facilities both in USA and abroad, George R. Vila, the company's president, said last week in New York.

Among the projects he detailed was the $2.5m. synthetic rubber latex plant to be built in the UK by Sto-Chem Ltd. This company has been formed by US Rubber and Witco Chemical Co. The plant is expected to go on stream late this year and will have a capacity of 8m. lb.

Mr Vila said plans included the expansion of production capacity for synthetic rubbers, plastics, chemicals and synthetic fibres which offered an attractive profit potential for the company. This would be particularly true in foreign countries, where the company was growing rapidly.

'Of the total,' Mr Vila said, 'about $30m. will be spent on modernization and expansion — an increase of 20% compared with 1960. Particular emphasis will be placed on quality control through automation of our tyre production systems and improving the nationwide distribution of our tyres.'

Versatile Rubbers and Plastics

He added that US Rubber expected to spend about $23m. on research and development. 'A major portion of this research investment will be in the development of new manufacturing processes, new fibres and more versatile rubbers and plastics,' he explained.

Mr Vila expected sales in 1961 to be at about the same level as 1960, although an early business upturn would force a revision of the estimate.

Domestic Consumption

Consumption of rubber by the whole US industry was anticipated to reach 1.6m. long tons in 1961 — an increase of 2½% over 1960; of this tonnage, he predicted, 72% would be synthetic and 28% natural rubber.

Mr Vila noted that the domestic rubber forecast included for the first time 'substantial' quantities of the stero-regular rubbers, polybutadiene and polyisoprene.

USA was still an enormous consumer of the world-wide supply of rubber, he declared, accounting for two-fifths of the total of 4m. long tons. Some 1.9m. long tons would be used by the rest of the Western World in 1961 and approximately 400,000 long tons would be imported into the Soviet Bloc, he estimated.

Suspension Development

'A major advance in the field of vehicle suspension' is announced by BTR Industries Ltd. with the development of a complete rubber 'in-sheer' suspension unit which eliminates the need for conventional steel springs or shock absorbers.

The secret of this 'in-sheer' mounting, an extension of the basic design of the BTR range of Vibro-insulators, is said to be in the strength of the rubber-to-metal bonding.

The new unit is the forerunner of suspension designs for use on railway carriages, rolling stock and other heavy vehicles. A number were thoroughly tested and proved on the bogies of tramcars used by thousands of sightseers at the Blackpool illuminations earlier this year.

More Chemical Prices Reduced

Reductions in price of more industrial chemicals — certain grades of polythene glycols — have been announced by Shell Chemical.

Three grades of the material, polythene glycol 200, 300 and 400, have been reduced in price by £10 a ton.

The biggest outlet for these glycols is in the manufacture of transparent cellulose film.

Both Shell and I.C.I. recently reduced the price of propylene glycol by £5 a ton. Other recent cuts in the general downward trend of prices have been in the prices of I.C.I.'s methyl methacrylate (£8 10s. a ton) and in the same company's Alloprene chlorinated rubber (£10 a ton).

Construction Starts on Dowty's Maltese Plant

WORK has started in Malta on a 12,500 sq. ft. factory for Malta Rubber Ltd., the subsidiary of Dowty Seals Ltd. The factory, which is sited on the Industrial Estate at Marsa will manufacture rubber seals for hydraulic and pneumatic equipment. It will be completed by April 1961.

Malta Rubber will at first employ about 120 people, and all its production will be exported.

Sir George Dowty, chairman of the Dowty Group, has said: 'This move has been brought about largely because of rapid business expansion and acute labour shortages in our present seals factory. Malta offers the ideal solution to our problems because it has plenty of the right sort of labour, and has many other advantages.'

Another UK firm which is planning to establish a factory on the Marsa Estate is Jablo Plastic Industries. It will manufacture expanded polystyrene insulating materials.

Russia Buys from Ceylon

Russia has bought 2,000 tons of rubber for January shipment from Ceylon.

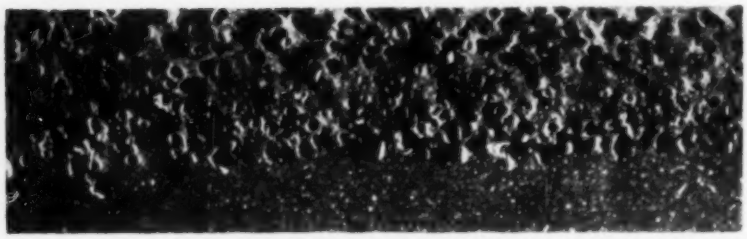
The present free market in Ceylon in sheet rubber is expected to continue until early February, when supplies will again be channelled to China to fulfil the contract to supply 28,000 tons this year. (*RJIP* Dec. 31, 1089.)

General view of the Marsa Industrial Estate, Malta, where Dowty Seals Ltd. and Jablo Plastic Industries are setting up factories

B1

Microcellular Compounds

By C. E. WEBB, B.Sc., A.R.I.C., A.I.R.I. *



Cross-section through a typical microcellular shoe sole

A new process for moulding a microcellular shoe sole directly to the upper has been developed. Adhesion problems between upper and sole are eliminated and the whole manufacturing process is speeded up, lowering the cost of production. A raw material designed specifically for this application was announced recently (*RJIP* **December 24, 1068**)

A NEW method for the production of direct moulded microcellular compounds for shoe soles was introduced some months ago by CIC Engineering Ltd., and Larkhill Rubber Co. (then Pussyfoot Products). This process, which is the subject of patent applications, results in a shoe bottom which has an outer skin of solid rubber surrounding a microcellular interior.

This method has been well tried and is now being used by C. and J. Clark Ltd., and other shoe manufacturers with satisfactory results. Light weight direct moulded footwear, having soling of average specific gravity 0.8-0.9 is now on the market. This type of footwear has the advantages over conventional stuck-on microcellular footwear of a much better sole and heel edge appearance and freedom from shrinkage. It also has the other advantages normally associated with direct moulded footwear.

Battery of direct moulding machines in operation. The speeding up of the manufacturing cycle increases output without extra cost

Blowing Agent

Conventional microcellular rubber is manufactured by incorporating a blowing agent in a suitable rubber compound and partly vulcanizing. The external pressure is then removed and the minute gas cells, formed by the decomposition of the blowing agent, expand. The cure is then completed in hot air or in a press under low pressure. The method of producing microcellular rubber by direct moulding involves the same procedure but all stages are completed continuously in the same mould. Pressure is applied initially and the sole mould is then lowered at a predetermined rate. Since there is a temperature gradient from sole mould surface to the last, the blowing agent will decompose first nearer the mould surface and then continue to decompose at levels further from the mould surface. At the same time, the rubber compound will be vulcanizing under much the same conditions. If cure rate and blow rate are so arranged that the blow takes place in the semi-cured layer and this layer is subsequently fully cured, a microcellular rubber is produced which will have been fully processed in the high pressure vulcanizing machine. It will, by virtue of its method of preparation, be free from the usual shrinkage troubles.

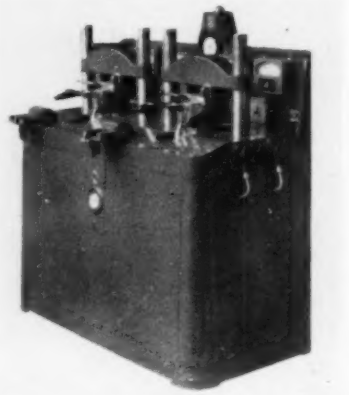
The metal last is maintained at a temperature of 100°C. and the side and sole moulds at 150°C. Cure times vary, depending on thickness of rubber to be produced, from 8-15 minutes. Rate of sole mould drop is closely related to the compound used, cure time and degree of expansion required. By varying the critical period during which the sole mould is stationary, skins of varying thickness can be produced, and by applying full pressure just before the end of the cure cycle, the layer of compound next to the upper and insole can be vulcanized without expansion, thus ensuring good adhesion.

Insole Material

Conventional vulcanizing cements are applied to the upper leather and similar precautions as in normal high pressure moulding should be taken. Insole material should be manufactured from material which is not affected by temperatures of 100-120°C. and should not be too thick or heat transfer from the last to the compound will be impaired. Heel blocks should be used and so designed that the thicknesses of the sole, heel and heel sidewalls are approximately the same. If heel blocks are made up of fibreboard, 5-10% compression allowance should be made when designing the blocks. The heel block should be accurately seated by sticking or tacking.

By varying the rates of piston drop, rubber bottoms can be produced

Continued on page 10



The Mark IV microcellular moulding machine developed by CIC Engineering Ltd.

*Research Manager, Larkhill Rubber Co. Ltd., Street, Somerset.

BRIDGE FARREL

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(Illustrated below)

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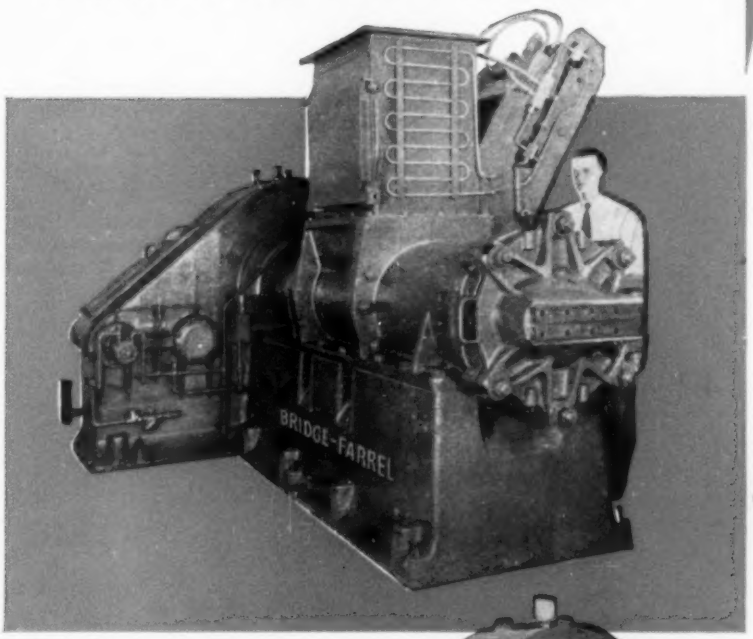

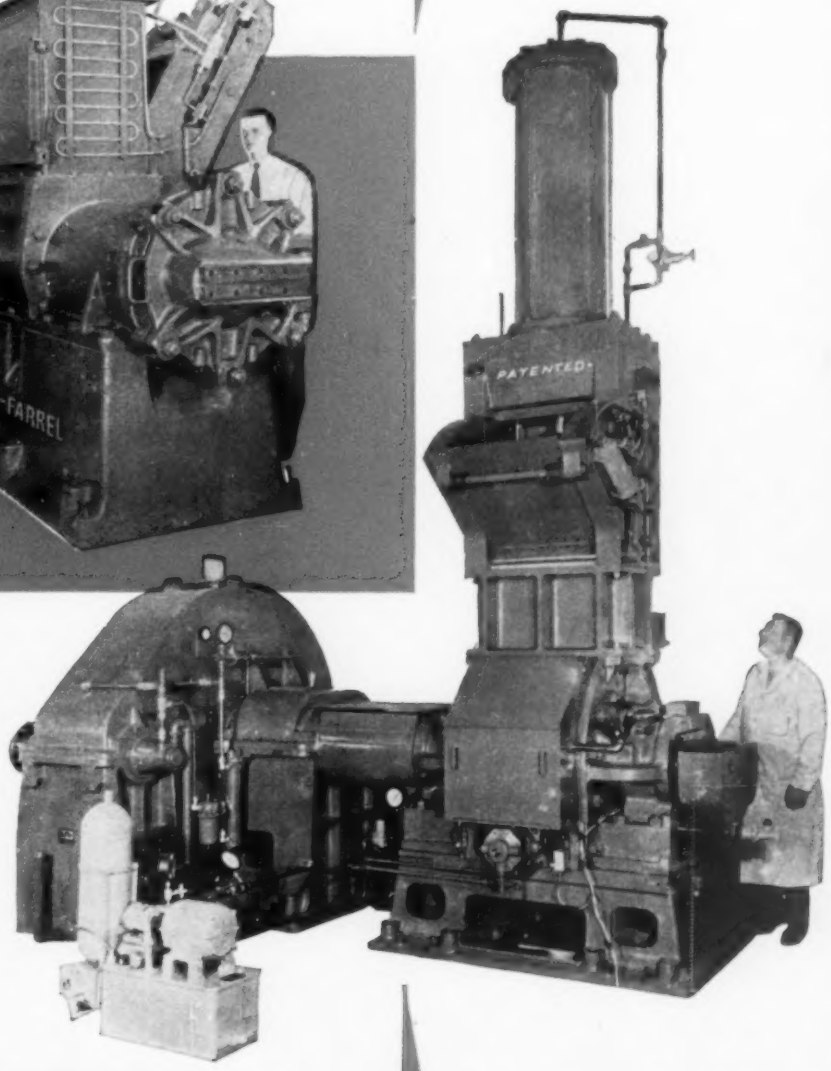

(Illustrated above)

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Rubber and Plastics in Cables

IRI PI CONFERENCE'S WIDE COVERAGE

A CONFERENCE on rubber and plastics in cables has been arranged jointly by the Institution of the Rubber Industry and the Plastics Institute (*RJIP*, December 24, 1067). This is to be held on March 1 in the building of the Institution of Electrical Engineers, Savoy Place, W.C.2.

The conference is open to non-members of the two organizing bodies and short synopses of the papers to be read are given here.

Nitrile/PVC Blends

The outstanding resistance to abrasion, oil, fire and ozone of vulcanized nitrile rubber/PVC blends has stimulated cable manufacturers throughout the world. In the paper on nitrile rubber and vinyl polymer mixtures to be read by Dr C. Y. Almond (I.C.I.) the effect of polymer properties on mixing conditions will be discussed and physical properties resulting from different mixing conditions reviewed. The physical (including electrical) properties of vulcanized and unvulcanized nitrile rubber/PVC blends are related to the use of these blends in covering electric cables. Comparisons will be made with other types of sheathing and insulating materials and existing potential uses of nitrile rubber/PVC blends in cable coverings will be discussed.

Irradiation

The irradiation of polymeric materials is becoming of increasing interest to the cable technologist, not only with the object of obtaining design data for insulation for use in nuclear reactor applications, but also as a useful technique for the modification of dielectric materials by radiation induced by cross-linking and graft copolymeric formation to give improved or potentially interesting products.

In his paper on irradiation of polymeric materials Dr R. M. Black (BICC) will discuss the criteria for insulation for use in nuclear environments. The chief limitations are found to be operating temperature and resistance to the effects of radiation and with organic polymers the maximum tolerable radiation dose would appear to be of the order of 5×10^8 rad. with a maximum operating temperature of 100-150°C. A pilot scale plant for radiation processing will be described and an account given of some of the recent applications of irradiated polymers.

Communications

R. J. Halsey (Director of Research GPO) in his paper on telecommunication (with particular reference to cables and their requirements) will outline the pattern of modern telecommunication systems, internal, international and global and of the trends of future developments. Cables, of different types and having widely varying requirements, are essential features of nearly every link in the complex network which must provide, *inter alia*, telephone, telex, music and television facilities.

Domestic networks must be sufficiently good to allow for connexions to other countries and to other continents where similar networks will be encountered. Inter-continental circuits, until recently all radio, are now being replaced and supplemented by ocean cables providing better and more reliable service.

Cables of all types require both insulation and protection from those external influences to which they are exposed; rubbers and plastics have important and sometimes exclusive roles in relation to both these requirements.

Oxidation Inhibition

The stabilization of plastic insulating materials for wire and cable will be discussed in the paper read by W. L. Hawkins and F. H. Winslow (Bell Telephone Laboratories Inc., USA). Plastic insulating materials exposed to natural weathering must be protected against both photo- and thermal oxidation. It has been found that carbon black, which is normally used as a light screen, may also inhibit thermal oxidation. The inhibiting properties of carbon black are attributed to the presence of oxygen or sulphur containing groups on the particle surface since increasing the concentration of these reactive groups considerably improves the antioxidant effectiveness of the pigment.

Carbon black and a variety of sulphur compounds form antioxidant combinations which inhibit polymer oxidation to a much greater extent than anticipated from the contribution of the individual components. Formation of these antioxidant combinations apparently is independent of surface reactivity since carbons, essentially free of reactive groups, also form synergistic combinations. Organic compounds which function similarly to carbon black with sulphur compounds have been developed. These compounds are related structurally to carbon black, and suggest the mechanism through which synergistic antioxidant combinations function.

Domestic Electricity

'The Problems of Electricity Transmission' is the title of the paper to be given by Sir Christopher Hinton (Central Electricty Generating Board).

For transmission outside urban areas, amenity apart, cable is rarely preferable to bare overhead conductors. The Generating Board uses little cable; the Area Boards use cables for virtually all their distribution within urban areas.

The main objection to undergrounding is cost. An underground 275kV cable costs 17 times as much as an overhead line of equal capacity; three-eighths of the cost is civil engineering work. The Generating Board is considering undergrounding in special cases. There is need to develop reliable cables for 275kV, 380kV or higher voltages; research is justified.

A fundamental difficulty with AC transmission is the necessarily high capacitance of the cable. The Board has studied the use of DC transmission, including underwater transmission links, in the interests of amenity, but the cost is prohibitive.

A large reduction in the overall cost of undergrounding low voltage cables is necessary. It is important to develop a flexible, compact, quickly jointed cable, that can be laid across country by a continuously operating machine. This calls for integrated research by cable experts and civil and mechanical engineers.

Butyl Insulation

The electrical properties of polymeric insulating materials in power cables will be discussed by N. Parkman (Electrical Research Association Laboratory). The aspects of the subject to be covered include the following: cable requirements and associated demands on the properties of dielectric materials—low field phenomena — high field phenomena — intrinsic electric strength of polymers (a) — practical electric strengths (b) — reasons for the differences between (a) and (b) — thermal breakdown and breakdown by discharges in polymeric dielectrics — illustrative examples of advantages and limitations of modern plastics and rubbers as cable insulation.

Despite the apparent suitability of butyl rubber as an insulating material its general adoption has been slow and only recently has its usage been gathering momentum. The reason lies in the balance of polymer properties which, while favouring service

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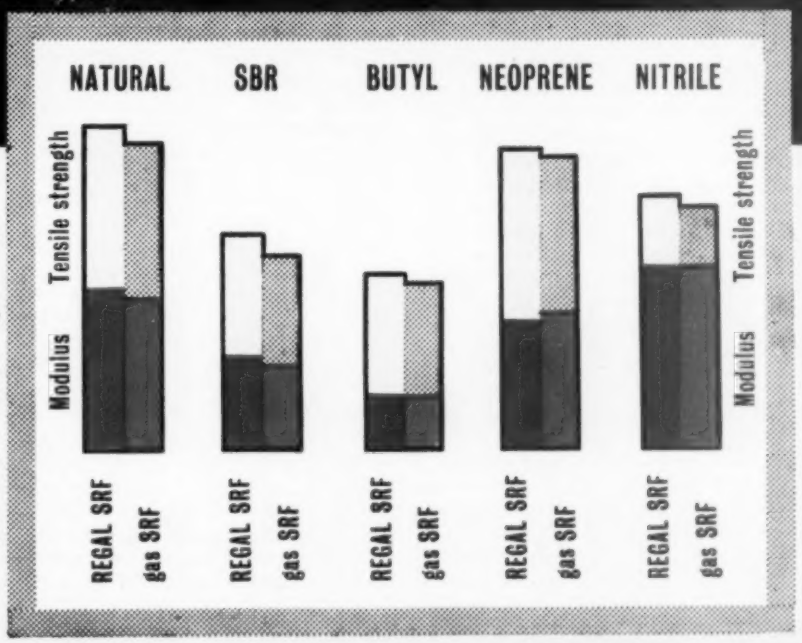

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performance, can prejudice compounding and processibility.

For cable insulation the basic polymer features of butyl are composition, molecular size and shape, cross-linking and response to degradation. Studies of these factors with particular reference to polymer filler interaction, accelerator function and cross-link stability have enabled the modification of certain properties without detracting from other desirable characteristics.

These developments, which have led to the introduction of new compounding ingredients and new processing techniques will be described by A. G. Strong (Esso Petroleum Co. Ltd.) in his lecture on the basis and practice of compounding butyl rubber for cable insulation. He will also discuss their application in the manufacture of high and low voltage butyl cables.

Two papers are to be given by K. H. Whitlock (Du Pont Co. (UK) Ltd.). The first of these is to be on recent developments in the use of neoprene for wire and cable. The service history of neoprene in the cable industry will be reviewed and recent developments associated with processing and compounding for specific purposes.

In his second paper Mr Whitlock will review the general processing, physical and electrical properties of typical Viton formulations and make some suggestions for possible wire and cable applications.

MICROCELLULAR COMPOUNDS

Continued from page 6

of average specific gravity ranging from 0.7 upwards. Pore size can be controlled so that it is uniform through the thickness of the sole or increases from sole surface to insole.

Various grades of compound are available from the hard resin rubber type to the soft resilient type. As with sheet microcellular the incorporation of high styrene resins assists greatly in promoting good cell formation. Strict control has to be maintained on cure and blow characteristics and it is advisable not to use the compound until 24 hours after manufacture. Shelf life is about three weeks.

Shaped blanks to the insole pattern are normally desirable. The thickness required will be related to the final density and can be determined fairly quickly by trial and error. For average thicknesses *i.e.* 12-20 iron, average reduction of 5 iron from the finished thickness will give approximately the required blank thickness.

Paper-chain Polymers

INTERLINKED RING SYSTEMS MEAN NEW TYPE OF ISOMERISM

THE formation of an entirely new class of chain-like molecules was described recently by Dr E. Wasserman of Bell Telephone Laboratories. These compounds, tentatively named 'Catenanes,' are composed of large interlocking rings which are otherwise unbonded. Physically, a model of the molecules is more similar to a linked chain (like a paper-chain) than so-called long chain molecules.

In the synthesis of the new compound, long straight molecules with a reactive group on each end were mixed with a large ring compound. In a small fraction of the mixture, a straight line molecule would be expected to thread through the centre of a ring, simply through mixing. When these straight molecules are closed into rings through reaction of the end groups, the threaded molecules form an interlocked pair with the ring molecules already present. Statistical analysis presented by Dr H. L. Frisch, also of Bell Laboratories, indicated that a few per cent of these interlocked pairs should exist.

Deuterium Tags

The presence of about 1% of these linked rings was demonstrated by chromatographic elution techniques. Subsequent degradation and identification of component fractions through the use of deuterium tags proved the existence of the new material. Further work is underway, aimed at producing enough of the catenane to isolate a pure sample and measure its properties.

Studies of molecular models indicated that the ring must contain at least 20 atoms, or segments, before the threading through of another molecule is possible. In the experiments reported by Dr Wasserman, the rings contained 34 carbon atoms, as did the straight line molecules.

In the interlocked form, one of the rings was a hydrocarbon while its partner was an 'acyloin,' with a carbonyl oxygen attached to one carbon plus a hydroxyl group on the neighbouring carbon.

Another Look at the Molecule

The demonstration of the existence of simple linked pairs introduces the possibility of more complex interlocked systems. It appears possible that three ring systems can exist in detectable quantities and these could be linked together in several ways.

Such interlocking forms will require chemists to take another look at the word molecule, since the separation of the two rings requires the breaking of a chemical bond, even though the rings themselves are not joined by any chemical bonding.

These new molecules also force consideration of an entirely new type of isomerism, based on topology, in addition to the well-known structural and geometrical isomerism. For example, a mixture of the two separate ring molecules, even though non-linked, is actually an isomer of the interlocked pair, since the chemical bonding between atoms is identical in both forms.

Complex Shapes

Another example of topological isomerism occurs in single, large cyclic compounds containing 50 carbon atoms or more. These can exist in large simple rings, or in a ring with a simple knot, according to Dr Frisch. Extremely complicated mathematical shapes, such as Moebius strips, are also possible through various combinations of cross-linking, interlocking, and knotting.

From analogy with other types of isomerism, topological isomers could conceivably differ in some of their physical properties, such as viscosity and melting point. Chemical reactions of this species would probably not differ markedly from well-known reactions, except for possible steric and specific interactions between rings and conformational differences.

New Upholstery Material from Commercial Plastics

Nappatex, a new PVC upholstery material from Commercial Plastics, will be on show for the first time at the 1961 Furniture Show next month.

Made in a range of 25 colours, Nappatex is produced in two grains, Empire Calf and Suedette—.025in. and .027in. nominal thickness — and in 48in. width. It is said to have a high resilience and spring, which gives an extremely rapid recovery when used for seating.

It can be laid-up, cut and fabricated by the sewing methods normally used in the upholstery trade; when sewing, 6-8 stitches per in. is the recommended tension. The sheeting can also be radio frequency welded.

Sales Planning and Control

INCREASING IMPORTANCE OF MODERN MARKETING TECHNIQUES

By J. P. STEPHENSON, M.B.I.M., A.S.M.A., General Sales Manager, Consumer Products Division, North British Rubber Co. Ltd.*

IT is becoming almost fashionable to criticize the marketing capacity of the average British company. The President of the Board of Trade has put his finger on this as one of the two main weaknesses in our export trade.

It is dangerously easy to fall into an assumption that there is some panacea within the sales sections of business activity that could produce the more favourable results that businesses in particular, and British Industry in general, are always in need of. Unfortunately, there is no easy solution to propound.

Lack of Management Attention

It is encouraging to note that increasing importance is being attached to the sales function and I feel that the inevitable corollary to this will be an improvement in efficiency. I believe that there is much that can be done to improve the organizational structure, the financial control, and the effectiveness of the sales organization of most companies. By and large, only a fractional part of the management attention that is given to the improvement of production control techniques is given to the sales organization.

I would broadly define the area of the sales manager's responsibility as covering the following two accounting sections: —

(a) All discounts and rebates given by the company, and costs incurred by the sale of obsolete and sub-standard merchandise.

(b) The warehousing and transportation, either at the factory or in branch warehouses, of the company's merchandise, and specific selling effort further sub-divided into advertising, and direct and indirect selling.

Both these two main groups can be effectively divided and subdivided, and the first prerequisite is that this is done, and that an annual budget is set up for the expenditures during the year on each section.

The responsibility, therefore, of the sales manager is to forecast with maximum accuracy the level of sales by whatever appropriate group is required, and the monthly flow of these sales during the year. His second responsibility is to forecast the monthly flow both of discounts and of sales expenditure. It is the responsibility of the accounting division of the company to set up reports that will enable both the sales manager and company management to check on the effectiveness of this forecasting and budgeting so that the appropriate adjustments in the expenditure can be made during the year to produce the most favourable end-profit result.

The two groups should, in my opinion, be established for all but the smallest businesses.

Section A. Discounts

This should be divided into:

Earned Cash Discount
Seconds Discount
Discount on Obsolete Merchandise
Quantity Discounts
Replacements and Adjustments
Special Discounts

Section B. Selling Expenses

This should be divided as follows:

Warehouse and Shipping
Advertising
Direct Selling
Indirect Selling
Branch Warehouses

Discounts

Most of the above sections will produce self-evident lessons, but it is impossible to ignore the creation of these sub-divisions. I feel that too often the decisions in business are made without a reference to the relationship between the discounts section and the selling costs.

As a simple but effective example, it might well be possible to increase volume by making a major discount to a specific customer or group of customers. This should not happen without a commensurate reduction in the previous percentage of direct selling expenditure on salesmen and associated expense. If this is not done because of a worsening competitive situation, the fact should at least be recognized. It is as well to analyse whether a volume discount could reduce transportation costs where trade is currently being done in uneconomic small parcels. This is probably the commonest managerial decision that is posed in the frequent grouping of the purchasing facilities of retail outlets, and the mergers and take-overs that characterize many industries. If such a volume discount is given, it can be made an economic one, rather than just a concession, provided that the reduction in associated expenditures in other sections which could be expected, do, in fact, occur.

Orders in Advance

On special discounts, it may be found that the gross profit can be substantially improved if orders are received from customers well ahead of the main selling season. It may be more profitable to give a 2½% discount for orders received three months ahead of the normal selling season in order that inventories could be built more exactly and profitably, or that production could be phased over a longer period, thus increasing efficiency and reducing costs.

The other item that is worthy of comment is the question of a trade discount. Quite obviously, the question of basically how one distributes one's merchandise is one of the fundamental issues of the entire company's operation. However, in perhaps the majority of cases, the historical pattern is the standard and almost unchangeable method of operation. I think that an aggressive management should regularly review the cost of doing business through the present agency, wholesale, or retail channels, and weigh the cost of this operation, and the discounts that it gives from its basic price against the relative increase that would accrue in the adoption of a theoretically more direct method of distribution.

It may well be, of course, that the equation shows an identical percentage profit through either the direct channel of dealing with the public instead of through the retailer, or with the retailer rather than the wholesaler, but that the whole project is well justified because (as I believe has normally been the main motivating factor in these changes of distribution) it provides a much more effective means of rapidly

From a paper given by Mr Stephenson at the 1960 National Union of Manufacturers Management Conference.

expanding total turnover with a substantially improved return on investment and net sterling profit.

However, it is equally true in certain industries and for firms of a certain size that the channel of distribution requiring the highest discounts is also the most efficient for the company's purpose, but it should almost always be commensurate with extremely low appropriations for both advertising and selling costs. There is, of course, no standard ratio because industries vary enormously and each case must be judged entirely on its merits.

Selling Expenses

I am often asked how much, as a percentage of total cost, should one appropriate to selling expenses. It is as impossible to be definitive about this, as applied to an individual firm, as it is to be explicit on the interpretation of the discounts section referred to above. Expenditure is geared to so many varying factors — production capacity; relative short and long-term profitability; long-term growth and stability prospects of the industry, and in so many cases the availability and cost of finance for expansion related to the previous section of profitability. However, it is possible in certain sections to apply one or two basic ground rules of percent expense and these will be referred to. Again, however, the primary initial responsibility is to forecast expense and to plot the actual expense against the anticipated figure.

The first section is in warehousing and transportation. Quite obviously in this section we have the greatest opportunity for improvement of overheads by the application of work study. Apart from the obvious handling and work flow principles that could be established, I would most earnestly commend to managements a very quick investigation into the time taken to put the goods into the customer's premises, rated from the time the customer actually writes out the order. From personal experience, I would suggest that there is considerable room for growth in the total company business, and share of the industry business enjoyed, merely by speeding up the shipments of the customers' orders.

Business and goodwill are also lost by poor handling of complaints and returns due to incorrectly shipped goods in the first instance. Some of this can be traced back to labelling practices. All too frequently goods are stamped in black on brown fibreboard which makes recognition difficult at every stage and is a root cause of many mistakes. A clearly designed label and an attractive pack,

● There is considerable room for growth in the total company business merely by speeding up shipments of customers' orders ●

giving excellent handling capacity, will often be found to produce economies more than saving the higher initial first cost. Also, one cannot ignore the advertising value of attractively and smartly labelled cases of merchandise.

The next section is advertising. No one has yet been able to define percentages here, and indeed, except on the most rudimentary form of advertising — the coupon mail order type — it is impossible to pinpoint the effective result of a particular advertising expenditure. It is possible, of course, more effectively in some industries than others, to see quite clearly the cause/effect/relationship of an advertising campaign.

For consideration here I would recommend a breakdown by section of expenditure of the advertising budget so that effective mental appraisal can be secured of the types of expenditure that prove retrospectively to be more effective in increasing sales. I believe that the greatest area for potential improvement lies in the presentation of goods that are sold to trade and industry which are not designed specifically for the consumer. So many products and processes which are in themselves admirable are poorly exploited and contribute to the common accusation that technologically we lag behind other countries in the most effective exploitation of our basic scientific resources. The communication of information between industries, and from one industry to another, is generally poor.

Direct Selling

In the direct selling section I include salaries, expenses and bonuses of salesmen and managers, and the tools with which the salesman or representative is provided as sales aids which he uses to put the company's story over to the buyer. There is a lot of nonsense talked about the control of salesmen and much of it stems from the problems of a paper such as this where it is necessary to compress a large subject into a few pages. Obviously, there must be quite a different approach to the control of a sales force of four or five people dealing in a senior and responsible way with major customers and who act largely as managers of their own time and effort, and to that of say a soap manufacturer where several hundred men may be under the control of field sales managers. Again, however, for all companies there are some ground rules to which I referred earlier. The first of these is that the reports and forms controlling a sales division, whilst they should be at the minimum, should be detailed enough to enable management to observe progress and to have a realistic control over field activities.

Man/Business Percentage

Perhaps the first sub-section on which one would require information is the comparison of the total cost of a man, his salary, his expenses, his bonus or commission, and any other fringe benefits, expressed as a percentage of the business secured from his territory. This percentage should be capable, from the records, of being compared with previous months and the same period in previous years. It should also be capable of comparison with the percentage costs of other representatives. Where applicable, this should be associated with the estimate of the degree of penetration being secured in each territory.

I believe that every man should work to a specific journey plan in covering his territory, and that this plan, of a given number of weeks' duration, should be submitted at intervals during the year as it would tend to change so that the actual pattern of calling can be compared. Reports of calls made can be either daily or weekly, although I would strongly recommend a daily report as being easier for the man and for head office, and a weekly advice of addresses to which communications can be sent. This does not imply that there would not be reasons for divergences from the journey plan, but I do believe that as a matter of sound business the representative should be required to state why the divergence from the plan has occurred. This mental discipline is essential in a salesman so frequently out of touch with head office for lengthy periods. I believe it to be quite within the capacity of the smaller and medium-sized companies to further break out a man's sales by outlet and his apparent share of the total of each outlet, so that not only can he be directed but also helped by management.

A further essential record is that both head office and the representative

keep a complete record of each customer on which is given the full details of the customers name and address; the buyer's name; a few personal details; the business done month by month; the advertising and display support given to the account, and the actual calls made. This is the life-blood of the business because fundamentally business is won and lost on individual accounts and it is the quiet study of these individual customer records that is the most frequent pointer to the reasons for the sales results being achieved.

Quite obviously, one could add appreciably to this list of records by sub-dividing further and adding in reports such as the number of new accounts opened, the number of accounts in the different turnover groups under £100, under £250, under £500 etc., and a comparison of the proportion of each with different territories and the overall average.

Higher Calibre

Further sub-division of bonuses or commission, and salaries paid, is again open to the widest interpretation. It depends enormously on the character of each business, but in general I think that the next decade will require, in consumer goods sales in particular, a higher calibre of man than we have either generally chosen or have been able to recruit hitherto. I believe that selling places a higher demand on intelligence and the qualities of initiative, moral courage, and hard work than any other comparably-rated section of business. To recruit men capable of representing the company and effectively selling the merchandise, as distinct from merely offering it, means to my mind that we must look to the man to whom we shall be pleased to pay a substantial salary that will represent his normal income.

I look at bonus or commission as something better paid quarterly, half-yearly, or yearly so that it becomes a genuine incentive over and above the normal capacity to do an honest day's work, and engenders the confidence and fighting qualities that I do not believe can come from a man on commission, either wholly or mainly, who is out to get the maximum turnover, irrespective of the wisdom of the advice he is tendering to the customer.

As a corollary to this statement, I would add that one must be quite determined to replace even the hard-worker who does not match the high standards one is setting.

A detailed study of an individual company's problems would necessarily go into much greater detail and I am quite sure that such questions as car operating, control of costs, and the type of aids provided to the sales force all offer great scope for analyses and improvement.

Indirect Selling

Indirect selling costs are again a major category in themselves and for management guidance must be sub-divided, for example:

How much do Conferences and Trade Shows cost?
How much is allotted to price lists?
How much do inside clerical supporting staff cost?

All these should be budgeted annually and a monthly recorded check made against this control.

Many companies have sales branches or offices away from head office. To a long-established company, many of these are often regarded as quite indispensable irrespective of perhaps drastic changes in the purchasing locations of their customers over the past decade or two. Apart from the obvious importance of knowing the precise sterling percentage cost of each and all of the branches, it is also essential to examine the function of each branch. How much business comes in the branch area because of the existence of the branch? What is this as a new percentage of cost? (At times it would be advisable to lose business if at the same time one could improve profitability.) With the improvement in transportation, could certain branches be translated into sales offices? What services do these branches perform either in the shipping of goods or the handling of complaints and queries from customers which could be handled as well if not better at head office? What services do these branches perform for the field sales force that are superfluous and out of tune with present requirements? These are some of the questions that an active management must put to itself, as a branch structure is essentially a costly one.

As a personal approach to this whole question of marketing, I regard this sales management and control as being the necessary bones of the business. Without it even the most rapid expansion of sales can lead to disaster. Only recently, I read of the case of a company manufacturing swimming pools in the US whose production had doubled in two or three successive years, and who were yet filed for bankruptcy. They were ambitious and creative marketing people and they had a product that the public wanted, yet their organization and control of selling and cost of production expenses was extremely weak. On the other end of the scale, a lack of appreciation of exactly where money is being spent leads to waste and the frittering away of a sales budget so that it becomes apparently impossible to break out from either a static condition of business or the sad downward spiral of decreasing business and returns.

Notwithstanding my fervent belief in sales management organization and methods, and my equally firm assertion that in many businesses this is sadly neglected by comparison with their cost of production control techniques, it is nevertheless only a basis of prosperity and not the creation of it. To create it, even with a first-class product, requires that having established the facts or variations of them in the sections detailed above, they are used as weapons of attack. They do not make advertising creative and exciting merely by illustrating how much is spent and where. They do not make for a successful sales force by merely having a controlled one. They do not make for the right business judgment on discount structures and sales policy even though the facts themselves are available for decision. They do not make for an inspired attack on a particular section of the trade or country. They do not make for general aggressive expansion.

Bare Bones Become Reality

Bare bones are turned into the exciting reality of success by the character, flair and ability of the sales management and the general sales force. It would be wrong, therefore, and misleading if I were not to leave this article on the note that people in sales are immensely more important than organization. Both are necessary. Possession of the right sales people can easily create a good organization. Possession of a rigid organization cannot of itself create the people. I think that all who are responsible for the overall management of companies should consider this fact before anything else. Otherwise disappointment is in store if the application of these techniques by themselves is taken as a guarantee of success.

● Possession of the right sales people can easily create a good organization. Possession of a rigid organization cannot of itself create the people ●

BICC's $7m. Canadian Contract

FOR WORLD'S LARGEST FLEXIBLE GAS PIPELINE

A CANADIAN contract for $7m. (£2.5m.) has been awarded to British Insulated Callender's Cables.

It is for the manufacture and installation of 53 miles of flexible submarine pipeline, which will carry natural gas from the mainland of British Columbia to Vancouver Island. This will be the longest flexible pipe line in the world, and will be made of lead pipe lined with high impact PVC and reinforced with steel.

The contract has been placed by the Magna Pipeline Co. of Vancouver. The pipeline will be attached to the coast-to-coast Canadian pipeline now being connected to the gas system of the United States to establish a gas-grid throughout the North American continent.

Developed from Pluto

The pipe, which has been developed from the wartime 'Pluto' pipelines, will be manufactured in four-mile sections at BICC's Trafford Park, Manchester, factory.

The system ordered will consist of two flexible pipes which will be able to transmit about 50m. cu. ft. of natural gas in 24 hours. It will be laid to a maximum depth of 810ft. and each pipe will have an external diameter of 7.5in.

Sea-Proving Tests

Full-scale sea-proving tests are planned for January and February 1962 and the pipeline will be installed in 1963.

BICC obtained the contract in competition with leading American and Canadian firms, and is said to have been the only firm to have offered a flexible pipeline.

Investment Pact

West Germany and the Federation of Malaya have concluded an agreement to guarantee the investments made in each other's countries against expropriation without compensation.

The agreement, which is for a minimum period of five years, lays down that any expropriation must be followed by just and immediate compensation.

Banir Balance

Banir Rubber Estates has received the balance of the money due on the sale of Banir Estate. Proposals for a capital distribution to stockholders are being formulated and will be announced in due course.

The estate was sold for about £195,000.

Book of the Conference

Orders may now be placed for the printed proceedings of the Natural Rubber Research Conference which took place in Kuala Lumpur in September 1960 (*RJIP* October 8, 526). These will be published by the Rubber Research Institute of Malaya early this year and orders should be addressed to The Director, Rubber Research Institute of Malaya, P.O. Box 150, Kuala Lumpur. The cost is $23 (Malayan) per copy, approximately equivalent to £2 13s. 8d. Additional cost of special packing and postage is $2 (4s. 8d.) book post or $5 (11s. 8d.) parcel post.

The proceedings contain over 1,000 pages, including the lectures by the guest speakers, Professors Blackman, Bonner and Gee, the final summary by Sir Geoffrey Clay, all the technical papers, together with discussions and a list of all participants.

The Malaysia Rubber Co. Ltd. have declared an interim dividend for the financial year which ended December 31 1960 of 7½%.

IRI News

J. W. Denson, chief chemist, Goodyear Tyre and Rubber Co. Ltd., has been nominated foundation lecturer for 1961 by the Institution of the Rubber Industry. The Lecture will be delivered at the Birmingham and Midland Institute, Paradise Street, Birmingham, on June 2.

Diploma Elections

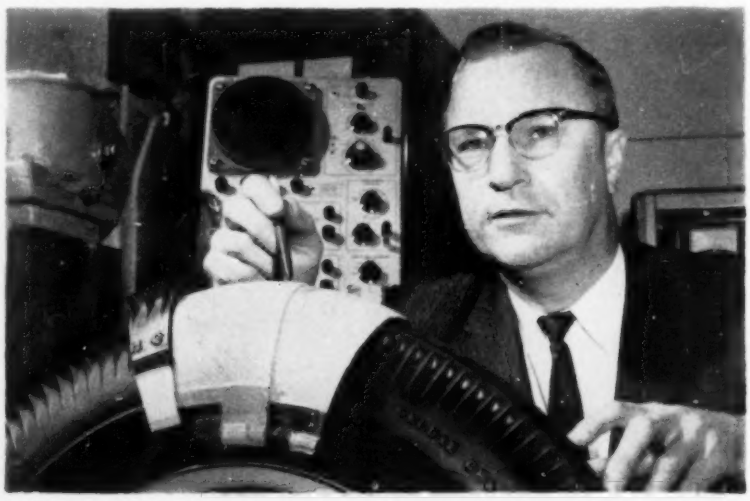
Prof. Geoffrey Gee and Sir Harry Melville have been made honorary fellows of the IRI. C. G. Moore has been admitted to the associateship and the following have been elected to long service membership: W. E. Duck, J. H. Mandleberg, Alan Speedy and R. W. West.

Special Meetings

The Young People's Lecture will be given by Dr L. Mullins at the Reardon Smith Lecture Theatre, Natural Museum of Wales, Cardiff, on March 27. E. S. Tompkins (IRI) and Dr G. Tolley (PI) will be speakers at the Spring Careers Festival in Birmingham. An IRI/PI symposium in Glasgow on April 14 has as subject 'Some new ideas in rubbers and plastics.' In Autumn 1962 there will be a week-end conference at Leamington Spa on 'The basis for Industrial Action.'

Publications

A monograph on 'Microscopy' by C. H. Leigh-Dugmore, and a textbook on 'Applied Science of Rubber Technology,' edited by Dr W. J. S. Naunton, are expected to be available this month.



A Firestone tyre engineer, Robert S. Lee, demonstrates the construction features of his company's two-ply tyre. Firestone says that it is possible that this tyre may be used as original equipment on future compact cars in USA. The company initiated an extensive programme for developing two-ply tyres in 1952 and since 1955 has produced thousands of them as original equipment for small cars made in Europe and as replacement tyres for European cars in USA

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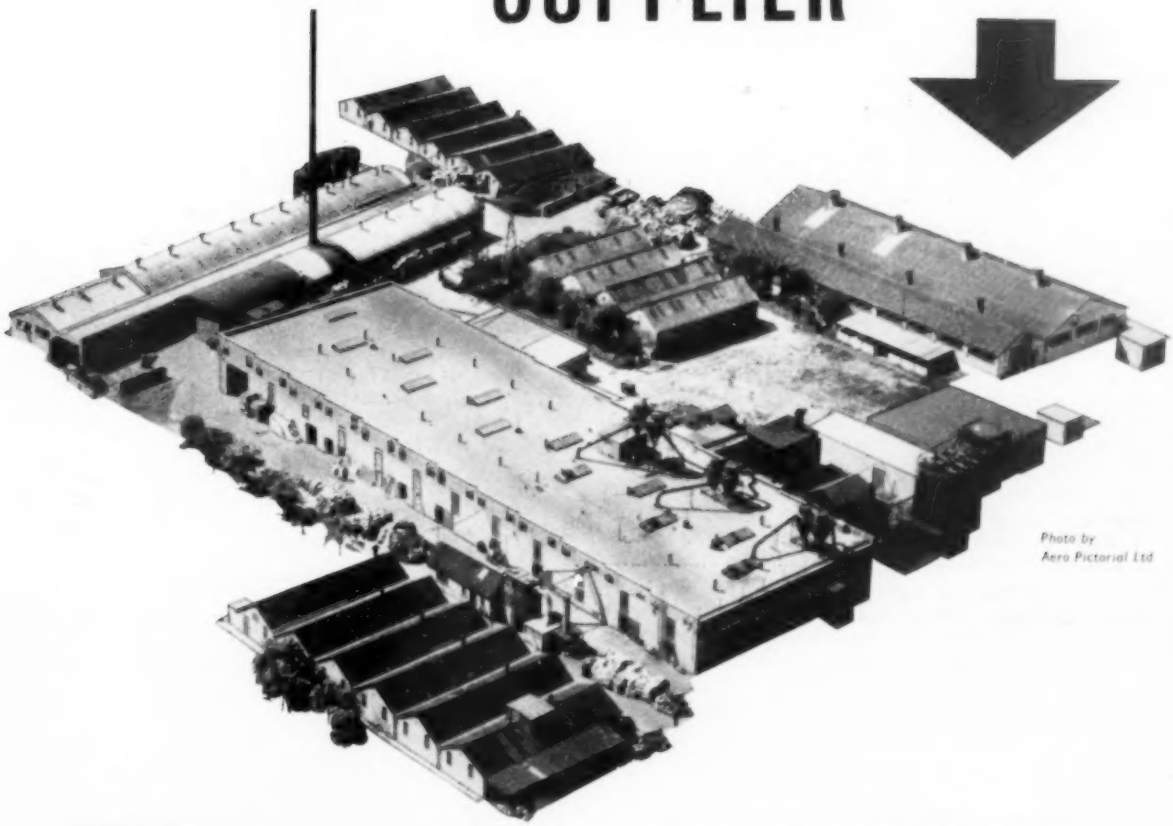

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VIEWS and REVIEWS

AN excellent, 'popular' introduction to the technology of petrochemistry, that is to the processing of crude petroleum into high polymers, is to be found in a 14-page article in the October issue of *Industries des Plastiques Moderne* (Vol. 12, No. 8, p. 4). The author, Maurice Moulin, deals simply and clearly and in a logical sequence with the basic processes under the title 'From Petroleum to Plastics.' The writing is lucid and the French not difficult to understand.

Preparing Basic Hydrocarbons

M. Moulin is the head of Esso's department of market research and development and naturally begins his survey with a consideration of the main methods of preparing the basic hydrocarbons from crude oil and then a brief study of the French petrochemical industry. He indicates the polymers for which these hydrocarbons are used as raw materials and then deals shortly with the historical development of plastics. Following this he describes in more detail the syntheses of macromolecular substances and discusses the classification of the various types of polymers, outlining the production reactions by which they are made.

'In order to convert petroleum, an organic material, into the diverse plastics materials known today many technical processes have to be brought into play. As far as the petroleum industry is concerned, these are distillation, the several methods of cracking, of isomerization, hydrogenation, separation, and rectification. For making plastics there comes into play principally the techniques of chemical synthesis for the formation of the desired monomers, followed by polymerization or condensation.'

French production and consumption of plastics is rapidly increasing, though still far behind USA, with its annual consumption of 10.7kg. per head of population while in France it is only 4.9kg. per head. The outlook is, however, one of increasing production not only for PVC which is France's major plastic but also because of known projects for polythene, polyesters and polystyrene.

Hydrocarbon Production

Petrochemical installations provide the raw materials not only for the plastics industry but 'especially for synthetic elastomers, near enough neighbour of the plastics industry, and for solvents, plasticizers, and detergents.' The outlook for the French petrochemical industry is very bright; she has large reserves of natural gas from which can be produced hydrogen, acetylene, ethane, propane, butane, ethylene, propylene, butylene and butadiene.

For producing these, the industry uses various processes. Catalytic cracking, using a silico-alumina catalyst on a mineral support, or catalysts based on magnesia and alumina, are employed mainly for the production of high-octane fuels but there are always gaseous by-products rich in ethylene, propylene and butylene. Reforming catalysis — generally using finely divided platinum — give fuels rich in aromatics. Steam cracking, which is the process best adapted to producing chemicals, gives large quantities of olefins, and small proportions of butadiene, isoprene, and cyclopentadiene.

M. Moulin gives a table of these hydrocarbons and the plastics materials of which they are the starting points. He gives another table which shows, among other things, that the production of plastics in Western Europe in 1958 was about three-quarters that of the USA and he has tables showing the production of artificial and synthetic fibres and of synthetic rubbers in France, Western Europe, and in the Western bloc as a whole. France seems to have lagged behind in the manufacture of synthetic rubber, because it was not until 1959 that France had her first synthetic rubber factory, making butyl rubber, but soon there will be plants making nitrile rubber and SBR.

Macromolecular Chemistry

Plastics are macromolecules, and 'many macromolecular compounds are found in all chemical spheres: the silicates in geochemistry, the proteins in biochemistry. If organic synthesis has already created many plastic and elastomeric substances, great progress has also been made by macromolecular chemistry in biology, going right to the frontiers of the problems of the beginnings of life and heredity. This chemistry of synthetic, macromolecular substances has given birth to theories and new experimental techniques, particularly about the physiochemical and mechanical properties arising from the enormous molecular sizes . . .'

Specialists and experts will bear with me, I know, if I go over simple ground; but many working in other fields will be glad of a birds eye view of the fundamentals of petrochemistry and polymerization.

No Known Limit

The percentage composition of many naturally occurring macromolecules has been known for a long time and their properties have been recognized as not being dependent on this proportion but modern techniques have shown that the important factor is the arrangement of the atoms and atomic groups in more or less regularly recurring units in long chains. Thus, one of the striking elementary differences between macromolecules and ordinary chemical compounds is the very large difference in molecular weight, say several hundred thousand against less than a hundred; there is, indeed, no known limit to macromolecular size: some proteins have a molecular weight of more than 10m.

As the number of monomeric units increases so the physical properties change. At present, the chemist has four main types of process available to him for producing macromolecular materials: polymerization, polycondensation, polyaddition, and copolymerization.

'These reactions have been made possible thanks to the considerable progress which has been made in the domain of catalysis, which comprises homogeneous catalysis, heterogeneous catalysis or auto-catalysis, and to our new knowledge of special types of reactions: chain reactions.' In the course of these reactions there are produced unstable molecules consisting of atoms or free radicals which possess one or more available valencies.

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

At least three phases can be distinguished in these reactions: initiation reaction, propagation reaction, and interruption or stopping. Certain substances, even if existing only as traces, can greatly influence the initiation and interruption reactions, leading to changes in the number of length of the molecular chains. Such substances are types of catalyst, or sensitizers or inhibitors. Sometimes water acts in this way. For several reasons it is thought that 'a catalyst is never theoretically indispensible for bringing about a reaction, but that, practically, its presence seems often necessary in order to speed up the reaction sufficiently.'

Polymerization

Polymerization is the joining together of the monomeric units without altering the percentage composition. Many organic substances can be polymerized but few give simple chains, branching and cross-linking generally occur, which creates properties very different from those of simple, straight chains. The conditions under which these effects are produced are now fairly well understood, so that, for example, ethylene can be three-dimensionally cross-linked by suitable irradiation, or vinyls similarly by providing an ethylenic linkage through an added substance such as allyl phthalate.

The simplest technique is mass polymerization which gives generally pure but non-homogeneous polymers, and is not easy to control. Polymerization in solution is easier to control and by choosing a suitable solvent one can ensure homogeneous polymers of fairly constant molecular weight. Solvent recovery is one of the disadvantages. The most commonly used method today is emulsion polymerization, which produces a latex to be used as such or coagulated. The catalyst system is based on an oxidizing agent or on a combined oxidizing-reducing (redox) system.

Suspension Polymerization

More recently, a new technique has been developed: polymerization in suspension. The monomer is only roughly dispersed in water by agitation to form droplets about 1mm. diameter with a simple stabilizer to prevent agglomeration. The main difference between this method and emulsion polymerization is that the catalyst used is soluble in the monomer. By this means is brought about a mass polymerization in an aqueous medium which can easily dissipate the exothermic heat. Polystyrene and PVC are made by this process. It gives a notably pure polymer of uniform particle size.

Polymer Types

There are two main types of polymers: homopolymers and heteropolymers.

The homopolymers (Fig. 1) contain only one monomeric unit, though they can be either simple chains or, more commonly, linear chains with lateral branches, which latter may be 'atactic,' having a random arrangement of side-chains; 'isotactic,' having a symmetrical arrangement; or 'syndiotactic,' having also a symmetrical arrangement but on opposite sides of the main chain.

The heteropolymers (Fig. 2) can be linear, block, graft or reticulated copolymers.

M. Moulin describes briefly the methods of producing these types of heteropolymers and then concludes his long article with several excellent diagrams of the main thermoplastic and thermohardening resins showing their manufacturing processes, properties, and applications, and gives tables of the chemical routes and intermediates.

Fig. 1. Homopolymers

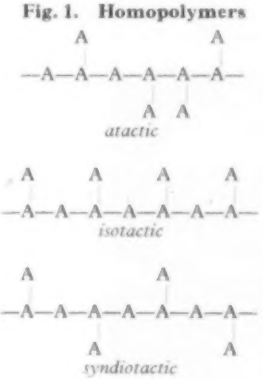
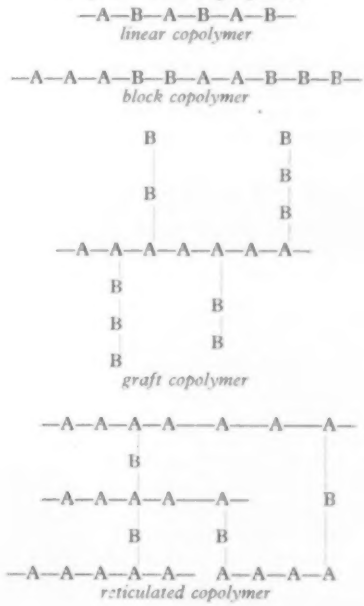


Fig. 2. Heteropolymers



A New Technical Journal

There has just been published the first number of *Zeitschrift für Chemie* which is to appear monthly from VEB Deutscher Verlag für Grundstoffindustrie, Leipzig. It is intended to publish work on the scientific problems of pure and applied chemistry and an attractive feature should be the 'Short Original Papers' in all fields of biochemistry, physical chemistry and geochemistry. So much has to be read in these days that any attempt to reduce the amount of reading without reducing the amount of information is worthy of support.

CHARLES JENNINGS

MEN *and* MATTERS

A Review of People and Events

by Peter Richards

FOR all rubber people the name that springs out of the New Year Honours List is that of George Beharrell, the chairman of Dunlop, who is created a Knight Bachelor. This means that once again Sir

G. E. BEHARRELL

George will sit in the chairman's office in St. James's Street — the present chairman's father, Sir George Beharrell, was head of Dunlop for many years until he retired in 1950.

George Beharrell, who is 61, was educated at Wellingborough. In the 1914-18 war he was an officer in the Royal Engineers. His early training was in the shipping business, and he joined Dunlop in 1928, becoming a director in 1942, and chairman in 1951.

Mr Beharrell is an honorary fellow of the Institution of the Rubber Industry. He enjoys the theatre and music, and plays a good game of golf.

Export Honours

Heading the Honours List is Sir Alexander Fleck, former chairman of I.C.I., who is created a Baron. Of interest to the plantation industry is the naming of the Prime Minister of Malaya, Tunku Abdul Rahman, as a Companion of Honour.

This year, for the first time, honours have been awarded specifically for services in boosting UK exports. One of the exporters to be honoured is James Scott, the overseas sales director of Crompton Parkinson, who receives the C.B.E. With Dr Mackay, chairman of Francis Shaw, he assisted in the negotiations which led to the UK consortium Rustyfa gaining the order for the £15m. Dniepropetrovsk tyre factory which is being erected in Russia. He has also taken part in planning this year's British Trade Fair to be held in Moscow.

Du Pont Appointments

Adrian C. Furse-Roberts, treasurer and secretary, and Samuel W. McCune III, general sales manager, have been elected members of the board of directors of Du Pont (UK).

Mr Furse-Roberts was born in Sydney, Australia, in 1914, and came to England in 1931. After holding important positions as chief accountant and secretary in leading British firms, he joined Du Pont (UK) in 1957 as comptroller. He is a Fellow of the Institute of Chartered Accountants.

Mr McCune, who has been living in London with his family since 1957, was born in Chicago, Illinois, in 1915. He has had 20 years' experience in research and sales of Du Pont rubber chemicals and elastomers.

Turner and Newall Changes

N. A. Morling, a member of the board of Turner and Newall and the present chairman of Turner Brothers Asbestos Co., J. W. Roberts and Glass Fabrics, has retired from these boards.

G. S. Sutcliffe, who is also a member of the parent board and was appointed to the boards of the other companies on July 1 last year, has become chairman of these companies. Mr Sutcliffe, who was chairman of Ferodo Ltd., has retired from the board of that company and Mr Morling has assumed the chairmanship.

Invasion Welcomed

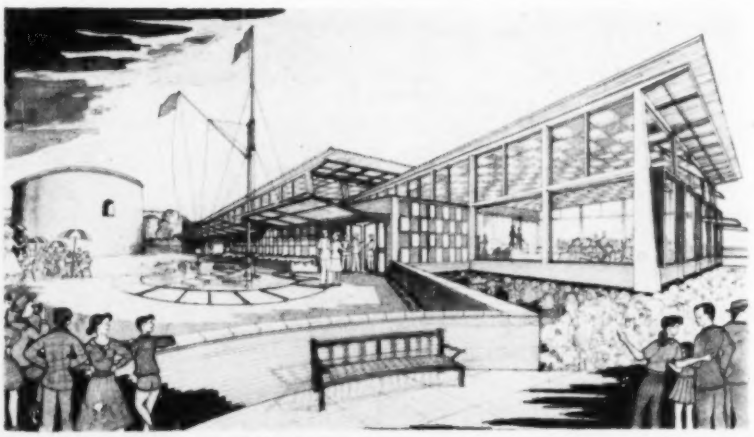
The Wish Tower is the name Eastbourne has given to its Martello Tower — one of the 68 or so built in the early 1800s along the Dover to Seaford coastline for protection against the threatened invasion by Napoleon. Many of these towers have been used for defence ever since, but now the site at Eastbourne is being developed to induce, rather than repel invasion. An ultra-modern sun lounge and café with a roof of reinforced plastics is being built in front of the Wish Tower, which is being restored.

The structural framework of the building consists entirely of timber. Cascophen resorcinal resin glue, manufactured by Leicester, Lovell and Co., was used for fabricating the timber beams and other on site glueing work. The roof is made of Filon glass-fibre reinforced polyester.

An Outdoor Word

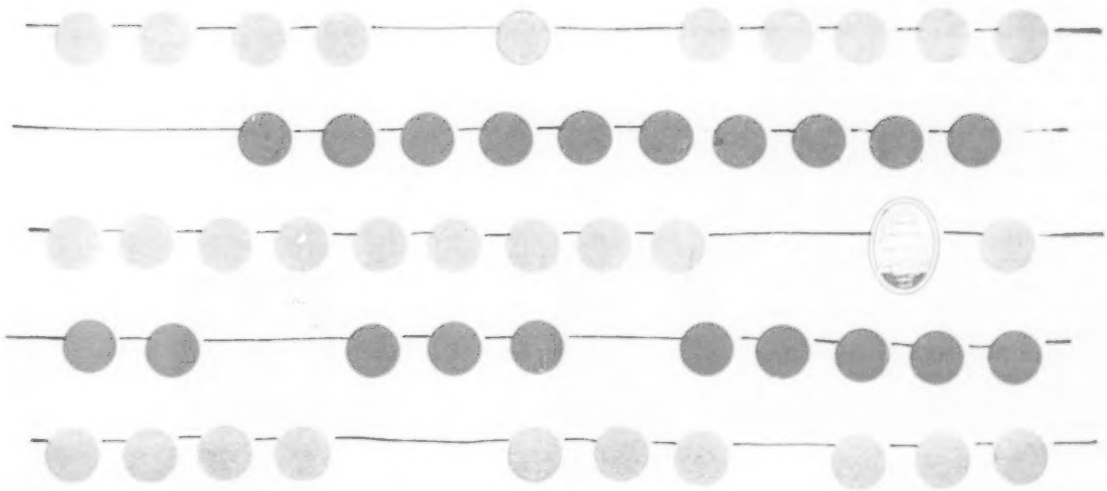
You may (even in this weather) come across young lovers on a park bench with mysterious music floating round them. A few years ago you might have rubbed your ears and wondered; now you know it is nothing to do with Cupid, but just another of those ubiquitous transistor radios.

'Transistor' has, in fact, become



An artist's impression of Eastbourne's new cafe and sun lounge, which will have a roof of reinforced plastics *(see: Invasion welcomed)*

beads you can count on...



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not merely a household but an outdoor word. Besides being made partly of plastics, I was interested to learn from the *Formica Journal* that transistors have to be made *on* plastics.

These delicate units have to be assembled by hand in carefully controlled laboratory conditions. Dust or other impurities must not come into contact with the germanium and silicone parts. In one modern factory where transistors are produced there are no windows and ambient dust is controlled to less than one cu. micron per cu. cm. of air. No one can use a pencil, because of the dangers of graphite dust. Wooden benches cannot be used, because such a surface 'shreds' impurities into the atmosphere. So the parts are assembled on benches topped with Formica laminated plastics — which does not contaminate the hyper-sensitive transistors.

More Rubber Soles?

I understand that the number of cycles used by the GPO has declined by 149 to 23,328. I cannot help wondering whether the postmen who must have been footing it have lost as much rubber off their boots as would have made 298 cycle tyres — or have they all been supplied with vans?

New Director for India

Harry Wogden, who joined the India Tyre and Rubber Co. in September as general works manager, has been elected a director. A Canadian, Mr Wogden has been engaged in the rubber industry since 1951, and was responsible for the design, layout and general establishment of latex foam production for Dunlop Canada Ltd.

He was assigned to Dunlop in Liverpool for several months, where he investigated production methods and development techniques for latex foam; on his return to Canada he was appointed development engineer, Pillofoam division. With the proposal to establish a further latex foam plant and a new tyre factory at Whitby, Mr Wogden was appointed manager, industrial engineering, in 1954 and became responsible for all aspects of project co-ordination. Later he became Plant Superintendent.

Daniel To Be Dunlop Buyer

Norman Daniel, who has been assistant general manager of Semtex Ltd. for the past 18 months will soon be taking over the post of general purchasing manager for the Dunlop group. He succeeds D. J. Flunder, who is taking up a senior position in the Tyre Division. Mr Daniel, who is 49, started his industrial life as an analytical chemist with the British Oxygen Co. From 1941 he spent six years in India, Pakistan, Burma and Ceylon as production manager, and subsequently general manager of the India Oxygen Co. In 1953 he went to Australia as managing director of a group of companies manufacturing a wide range of products.

He joined Semtex in 1959 and has been responsible for certain organizational changes both on the managerial and marketing sides. He was associated with the development of vinyl flooring, notably Vynolay, the product now marketed by the Dunlopillo Division of Dunlop.

Metal Box Chairman Retires

Sir Robert Barlow has retired from the chairmanship of Metal Box and has been appointed honorary president of the company. He has also retired from the chairmanship of Metal Box Overseas. He remains a director of both companies.

Sir Harold Roxbee Cox has been appointed chairman of both companies.

M. Morris (left) has retired after 35 years as technical sales engineer in the Merseyside area for George Ellison Ltd. He has been succeeded by L. C. Bentley

Question Corner — 151

(Second Series)

476. Polythene bottles and similar hollow shapes, both rigid and flexible, are produced by several blow moulding techniques. Give some details of the injection moulding method.

(Answer next week)

Answer to Question Corner — 150

475. Polythene is being used for coating a variety of materials such as paper, cellophane, aluminium foil, glass fibre, textiles, and this is achieved by extruding a thin film of molten resin and pressing it on to the base without the use of an adhesive.

Generally, such materials have the following properties:

(a) Low moisture vapour permeability.

(b) Excellent grease resistance.

(c) Good flexibility even at refrigeration temperatures.

(d) Good heat sealability.

(e) Good chemical resistance.

(f) Low specific gravity and, therefore, low coating cost because of high surface coverage per lb. of resin.

(g) Odourless, non-toxic and tasteless.

Coating in this sense should not be confused with laminating, which is a combination of two or more webs by means of an adhesive.

(Another question next week)

Polly Ester Says . . .

'NOMOGRAPH — sure it is a drawing by the little people'

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Plantation Commentary

SUCCESSFUL GROUP PROCESSING CENTRES

by our Malayan Correspondent

FROM KUALA LUMPUR

A NEW way of putting across what is basically an old idea to smallholders may eventually have a considerable effect on the type of rubber produced by Malaya. The 'group processing centres' as they are called, 54 of which are working, are enabling smallholders to produce cleaner and better smoked sheet, and in the process to get more cash for their rubber.

Total production at the moment is running at the rate of 1,000 tons a year which is small when compared with the 290,000 tons a year that is produced on the average by all the smallholders in Malaya. But the rubber produced by the group processing centres is No. 1 or No. 2 RSS and the indications are that the number of centres will grow. A year ago there were only 33.

Keeping the Pot Boiling

In the past the Rubber Research Institute of Malaya and other organizations have tried various means of getting the smallholders to come together and receive the benefits of large-scale processing on a co-operative basis. Many of these schemes have had disappointing results. They needed a certain amount of management which was hard to find in the average village and called for a certain amount of book-keeping.

The group processing centres, started by the RRI, are simplicity itself. The guiding spirit behind them is usually the local rubber instructor who introduces the idea to the smallholders and keeps the pot boiling until a sufficient number have become interested.

The centre works best with multiples of 15. It consists simply of a factory with the bare essentials needed for processing and a smokehouse which is also somewhat rough and ready but perfectly adequate for the work it has to do.

The smallholder working in the group taps his own rubber and takes it to the factory. There he processes it himself. He stencils his own sheet and leaves it with the rest of the rubber to be smoked. When smoked, he then makes his own arrangements to sell it to whichever dealer he fancies.

Rudimentary—But it Works

This is pretty rudimentary stuff but the beauty of this simple system is that it works where more sophisticated systems which would give better results have failed. The capital outlay is very small and the working cost of the group centres is confined to a watchman-caretaker smokehouse operator. The smallholder who takes part in the scheme gets immediate results when he takes the first batch of his newly-smoked rubber from the communal smokehouse and gets more for it when he sells. There are none of the annoying deductions for administrative expenses which are inevitable with a co-operative and which are exceedingly difficult to explain to the average smallholder. At a group processing centre the smallholder can readily understand the small payment that he makes on his own terms to the caretaker and for the purchase of wood fuel for the smokehouse.

The improvements in the standard of rubber produced come from the fact that the factory is based on the RRI method of producing rubber which emphasizes the need for good strainers, a proper supply of clean water, clean equipment, and such items as a roof on the factory that will not drop twigs and leaves into the latex.

At present prices, the smallholders working through a group processing centre can pocket as much as 3d. a lb. extra by producing good quality rubber compared with the grades they turned out before.

The Cost of Smoking

The cost of the scheme is one of its most telling points.

Working on the basis of a centre for 30 smallholders, which seems to be the usual size, the cost of a processing factory and smokehouse works out at about £240 if contractors do the work.

If the smallholders themselves do the work and use materials to hand the cost is naturally much less.

Using jungle wood and doing the constructional work themselves, the cost comes down to about £70 with most of the money going into the concrete floor and drains for the factory and the brick and concrete work for the smokehouse. In both cases equipment for the factory costs about £60.

The total cost for each smallholder is about £4 each on this basis and most smallholders can find this kind of money without too much difficulty. The cost of smoking the rubber in their own smokehouses in the way of wages to the caretaker and wood fuel is estimated to be less than a penny a kattie (1⅓lb.) as against considerably more than a penny a kattie that they have to pay to a dealer to smoke their rubber for them.

The point of the system is that they process their rubber in good, clean conditions, using proper equipment at a centre which can be visited frequently by the local RRI rubber instructor who can ensure that proper methods are followed. In consequence, they have a good grade of rubber to offer which fetches a higher price.

Obviously there is plenty of scope here for taking the group processing system further. The logical step is to introduce bulk marketing of the rubber produced by the group centre and three of the 54 centres have to date associated themselves with co-operative marketing societies. This is a bigger step along the road to a full co-operative than it appears for it means lumping all the rubber produced together and some smallholders produce better rubber than others and know it. The advantage is that it does help the smallholder to free himself of his dependence on the rubber dealer and to sell his rubber at a figure that is a good deal nearer to the price the manufacturer pays for it in Britain.

From here the next stage would be to large co-operative factories and bulk processing and smoking. But this is looking rather far ahead. The present group processing centres work because they are simple and readily understandable. They are unique because there has not been one failure and it would perhaps be unwise to try to rush matters until there has been a lot more experience.

Training School to Close

An unusual institution in Malaya, a school for planters run by a commercial firm, is expected to close soon, its job done of providing sufficient young Malayans to meet the recruiting needs of the estates concerned. The school is run by the REA and Cumberbatch Ltd. group and when it closes in March, as it will do if present plans are followed, it will have provided the estates concerned with 19 young Malayans who in years to come will probably be promoted to be managers of estates.

The principal of this unusual and very select school is Mr N. J. A. Foster, a planter with many years' experience in Malaya, who started the school for REA Cumberbatch in March 1957, on Effingham Estate, which is about eight miles from Kuala Lumpur. The school took over a rambling, 40-year-old bungalow surrounded by rubber, fruit trees and neatly trimmed lawns. A hostel was built for the students close to the bungalow to provide sleeping accommodation, a lounge, a recreation room and the students' own cooking facilities.

Close Co-operation

The school is not part of the estate but there is naturally close co-operation. Effingham Estate offers a fair cross-section of the plantation industry as it is today, with old rubber, matured replantings and new planting and replanting in progress.

Six students normally make up one course, though there are seven on the present course. The school started in the belief that it was better for Malayans to be given proper training

Continued on page 25

LIFE INSURANCE

The life required of a finished product is an important guide to the type or quality of materials incorporated during fabrication. Thus, choice of an antioxidant depends on the type of article being manufactured and on the service conditions encountered. In many cases the average life of the article would not justify the use of the more expensive antioxidant. In other cases, the expectation of life or the service conditions demand the best product available.

Essentially, non-staining antioxidants are used in rubber articles for two reasons in addition to their protective influence:

(a) To retain the appearance of white or light coloured rubbers on exposure to light.

(b) To avoid the discoloration of other materials, such as rubbers, plastics, paints, etc., that are in contact with rubbers of any colour.

Many footwear compounds and some types of rubber toys are typical examples of applications where maximum life is not demanded, and where Nonox SP, NS and NSN from the Nonox range of antioxidants have proved adequate. Nonox SP and NS have also been used in latex products, including latex foam. In general, the ageing properties of latex foam articles are fairly good but they are also expected to last for many years. More efficient antioxidants would generally be recommended in this case.

A group of very similar antioxidants, differing chiefly in physical form, is comprised of Nonox EX, Nonox EXN and Nonox EXP. Of these, Nonox EXN is a little weaker and slightly more liable to stain than the other two. All three give good protection and are recommended for a wide variety of applications with the exception of latex goods. The principal uses lie in mechanical goods, including extruded goods. All three have been used successfully where migration staining to paints is a problem. Unexpected effects can, however, be encountered and each case where migration staining can occur should be examined separately.

Two other antioxidants in the group are of especial interest in that they are used with outstanding success in a wide range of latex articles. Particularly recommended for such uses is Nonox WSP, a highly efficient antioxidant normally retained for the more critical applications. Nonox WSL combines efficiency of the high order of the Nonox EX, EXN, EXP group with minimum staining. Although its use is not advised in rubbers that come into contact with PVC, it can be used to advantage in white tyre sidewalls.

Developed as an exceptionally powerful non-staining copper inhibitor—and as such particularly valuable for cable insulation, proofing and latex compounds—is Nonox CNS. This surpasses all the previously mentioned antioxidants where metal inhibition is required and is, in its own right—having the same order of efficiency as Nonox WSP—a very powerful conventional antioxidant.

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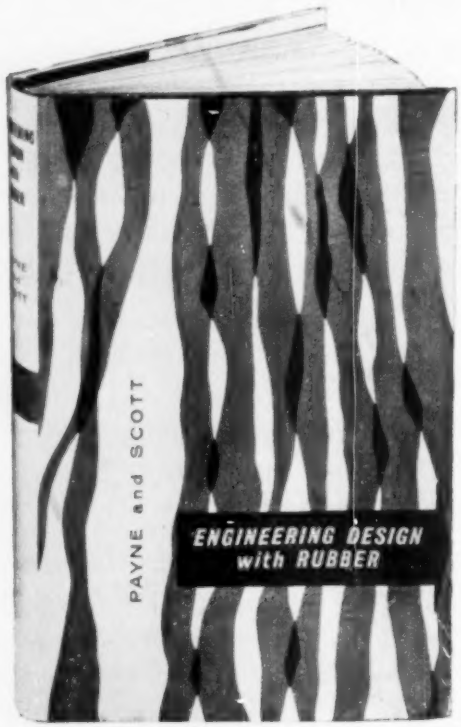

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Other Properties Relevant to Engineering Design

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The Use of Rubber in Engineering
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Collaboration Between the Engineer and the Rubber Technologist
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PLANTATION COMMENTARY

Continued from page 22

before being put onto estates as opposed to the usual method which is to put a trainee planter directly onto an estate and judge progress by the amount he picks up.

Results seem to prove that the REA Cumberbatch philosophy pays. As Mr Foster put it: 'The 12 boys who have left here have all done very well. The other way is to put them straight onto estates. They arrive knowing nothing and it is doubtful if it is worth it. Few managers have time to give them proper training.'

It is, in fact, during the first year on an estate that a considerable wastage occurs during training. It is eloquent testimony to the work of the school that all 12 who graduated have successfully completed a further year working on estates and are now assistant managers.

Trainees for the school are selected from the large number that apply after a pretty lengthy weeding out process. They are first sent to Outward Bound for a report on their abilities and for the kind of toughening up that the Malayan Outward Bound School provides.

The trainees at the planters' school get an early introduction to estate life with a timetable that calls for a 6.30 a.m. breakfast before they leave for three or four hours' work in the field. There are classes in theoretical planting before lunch and further classes after lunch.

The type of field work they do is indicated by a three-acre plot in a large replanting area belonging to Effingham Estate which the trainees have replanted themselves from scratch as an exercise, including the hard and unpopular task of terracing. They have also prepared a demonstration plot to show the various types of covers and have graded them according to desirability.

Running Their Own Affairs

Class instruction is based on Edgar's Manual, RRI Bulletins, Butlers' Estate Accounts and Well's Colloquial Tamil. Examinations are held three times during the course. Part of their training is in running their own affairs, and in turn they are senior assistant, catering officer, mess officer, accountant, clerk and typist. Estate accounts and estate clerks' duties are among the subjects taught at the school and they are encouraged to keep their own accounts in similar order.

Most of the trainees have been between 18 and 24 and are of various races. The present seven are made up of one Indian, four Chinese, and two Malays, and the kind of problem that this sets the mess officer of the week in catering for the different food preferences is the type of situation that they will have to handle on estates.

Apart from their work at the school, the trainees are taken on visits to other estates to study work there and to the RRI Experimental Station a few miles away. At one stage during their course, they are attached to an estate for a two-week period to see how the theory they are learning works out in practice.

The school is not cheap to run and the trainees are paid during their year at the school a salary of just under £50 a month.

But, as the principal pointed out, if they had been taken onto estates direct they would still have had to be paid and young trainees who go direct to an estate are not generally considered to be of any help in the first year.

After leaving the school, the trainees are attached to estates for another year after which, if their progress has been satisfactory, they are appointed assistant managers at a salary of £60 a month.

With conditions as they are today, young Malayans who have got this far have obviously an excellent career ahead of them in the planting industry.

The present course of seven trainees will end in March next year and then the school is likely to close down. This is not a reflection on the training it provides but follows on from the fact that with 12 new assistants and seven more in training no more probationers are being recruited by the company for the time being.

Seed Export Booming

Malaya is now doing a reasonably profitable business in exporting rubber seeds and planting material. They have established a reputation as being among the best in the world and political difficulties that at first seemed likely to bring about a ban on the export of all kinds of planting material have now been overcome.

At present the Government allows planting material to be exported to countries which contribute to the Malayan Rubber Fund Board, the organization responsible for financing research and development in the Malayan industry, and to countries with which the Federation has reciprocal arrangements for exchanging planting material. In the first category are Singapore, North Borneo, Sarawak, Brunei, Nigeria and Britain (through the British research institutes). In the second category are Burma, Ceylon, Ghana, India, Indonesia, Liberia, Pakistan, Papua, the Philippines, Thailand, Uganda and Vietnam. Reciprocal arrangements are being negotiated with other countries.

This year rubber seeds have been exported to the following countries: 6,500,000 seeds to Burma for $864,048; Sarawak 2,000,000 seeds ($390,000); North Borneo 1,500,000 seeds ($162,990); India 1,000,000 seeds ($102,126).

A Government official pointed out that Malayan rubber seeds were now considered to be among the best in the world and would provide trees with yields of up to 2,000lb. an acre. 'They are therefore in great demand especially by such countries as Sarawak where rubber planting is being intensified,' he said. 'We send them not only seeds but budwood as well.'

Under the reciprocal arrangement, Malaya expects the other countries to send their planting material when asked to do so. Burma and Thailand, for example, have done quite a lot of research on rice and it is possible that Malaya will ask for some of their high-yielding rice seeds. Malaya is also interested in planting material produced by selected breeding in the banana and cacao industries.

Squeezing the Planter

Comment by rubber industry leaders has been guarded, though leaving no doubt that the move is regretted, on the increases in the rubber export duty which were announced by the Minister of Finance, Mr Tan Siew Sin, in his budget speech. It was not generally expected that the Minister would raid the industry again to get the extra money he needs.

The vice-chairman of the Rubber Producers' Council, Mr J. Brown, said that the council was perturbed at the prospect of an increase in the already high rates of taxation. Mr H. Paterson, the chairman and general manager of a number of rubber companies in Perak, said that further taxation on an already heavily taxed industry was by no means beneficial and naturally did not offer encouragement. 'However, in a rapidly advancing young country such as this, money must be found to pay for the social services and to meet the ever-increasing bill for education,' he said.

The actual increases are fairly small but are progressive. When rubber (calculated at 2s. 4d. to the dollar) is selling for 20.4d., the duty imposed by the new Budget will be fractionally less than the present 1.75d. but this rises by a sliding scale until at a price of 2s. 4d. the new duty is 0.56d. above the present rates.

2s. 1d. Rubber This Year?

Of more potential importance, if boom times come again, is the conversion of the anti-inflationary cess into export duty. This was a special cess that was placed on rubber when the price was more than 2s. 4d. to mop up excess funds. It became progressively steeper as the price of rubber rose.

The money was kept by the Government until the price fell to an agreed level for a certain period and was then paid back to the producers. It was, as its name suggests, anti-inflationary.

Now this cess will not be repaid in future and has been incorporated in the export duty which rises steeply above the $1 (2s. 4d.) mark. At 3s. 6d. a lb. the new export duty is 10.465d. compared with the old duty of 6.30d.

Possibly these rates will never be applied for there is not much hope that rubber will be up above 3s. a lb. this year. For the record, Mr Tan based his Budget on an average price for rubber during 1961 of 2s. 1d. a lb. and a production of 730,000 tons. He agreed that this price estimate may well be on the low side but felt it better to be conservative when budget preparing.

Plastics Statistics

NOVEMBER EXPORTS AND IMPORTS

PLASTICS materials exports rose slightly in November 1960 to 14,934 tons, which compares with 14,474 tons in November 1959, and 12,862 tons in October 1960. The value was £3,667,465 — £3,867,383 in November 1959 and £3,191,522 in October 1960. These figures are given in the official Trade and Navigation accounts, which show that the biggest quantity was taken by Australia (1,127 tons), followed by Sweden (1,020), France (843), Denmark (789), and South Africa (659).

Imports during the month were 9,014 tons valued at £2,998,124, compared with 5,652 tons and £1,829,845 in November 1959. USA was the major supplier with 3,402 tons, followed by Western Germany (1,800) and the Netherlands (422).

Imports for the first 11 months of 1960 stood at 85,510 tons (£27,256,225) compared with the corresponding 1959 figure of 48,553 tons (£17,738,651).

Exports for the first 11 months of 1960 amounted to 156,895 tons (£39,451,368); the 1959 figure was 143,181 tons (£36,406,914).

Details of imports of plastics materials during November 1960:

	Tons	£
Alkyd solid and liquid resins, solutions, emulsions and dispersions	242	47,320
Cellulose plastics:		
Photographic (including cinematograph) film base (except acetate butyrate)	260	336,766
All other	217	200,716
Polyvinyl chloride:		
Polymers and copolymers	2,614	379,142
All other	562	1 9,126
All other	5,119	1,835,054
Total	9,014	2,998,124

Exports of plastics materials during November 1960:

	Tons	£
Acrylic sheet, rod, tube, film, foil and profile shapes in primary form	715	420,753
Alkyd solid and liquid resins, solutions, emulsions and dispersions	519	97,635
Aminoplastics:		
Solid and liquid resins, including solutions	1,275	139,444
Moulding and extrusion compounds	921	166,267
Cellulose plastics:		
Moulding and extrusion compounds	292	89,925
Sheet, rod, tube, film (excluding regenerated cellulose), foil and profile shapes in primary form)	179	114,112
Phenolics and cresylics:		
Solid and liquid resins (straight and modified)	1,109	223,943
Other	682	227,325
Polystyrene	1,264	252,735
Polythene (polyethylene) sheet, rod, tube, film, foil and profile shapes in primary form	192	73,589
Polyvinyl chloride:		
Polymers and copolymers	1,684	223,961
Moulding and extrusion compounds	902	217,785
Sheet	836	337,018
Other	88	25,068
All other	3,956	980,735
Waste and scrap (including celluloid and film waste and scrap)	680	77,170
Total	14,934	3,667,465

UK exports to countries in the European Economic Community (Common Market) and the European Free Trade Association are shown below.

EXPORTS TO EEC

	Nov. 1959	Nov. 1960
Western Germany	844	332
Netherlands	616	623
Belgium	420	390
France	383	843
Italy	417	547
	2,680	2,735

Exports to Commonwealth countries during the month were 4,834 tons (4,6[illegible]2 in November 1959) and exports to all other foreign countries were 4,108 tons (4,276 tons).

EXPORTS TO EFTA

	Nov. 1959	Nov. 1960
Sweden	795	1,020
Norway	559	579
Denmark	693	789
Switzerland	290	252
Portugal	260	446
Austria	215	171
	2,812	3,257

(Any apparent discrepancies are due to rounding off of figures)

Guatemala Law for Rubber Cultivation

A law has been passed in Guatemala to promote the cultivation of rubber.

Under the law, planters, including existing planters who expand their cultivation, will be exempt for a period of ten years from land taxes and from taxation on cultivation profits and importation of materials, machinery and equipment needed for the cultivation of rubber.

The law also takes into account the fact that rubber trees take up to 15 years to mature by providing that local banks will not be bound by the short credit terms imposed by the banking laws but may grant loans for rubber cultivation for periods of up to 20 years.

The importation of either rubber tree seeds or the vegetative parts of rubber trees is controlled by the Guatemalan Ministry of Agriculture.

Canadian Papers

The rubber chemistry division of the Chemical Institute of Canada will feature a one-day programme of technical papers during the Institute's 44th Canadian Chemical Conference and Exhibition, scheduled for August 3-5 1961 in Montreal, Quebec.

Tyres for the New Jet

The new Boeing Jet Aircraft 720-048 being operated by Irish International Airlines on the Atlantic run has been equipped with Dunlop tyres.

The tyres have also been sent out to America for Irish International Airlines to use while training pilots for the aircraft.

This integrally designed pair of coach seat frames is the latest product of the plastics division of Dansk Automobil Byggeri A S, the Danish associate of Leyland Motors Ltd. The frames are moulded in glass-fibre reinforced polyester

Rubber Statistics

UNITED KINGDOM — UNITED STATES — JAPAN — MALAYA

UK imports of rubber (natural, synthetic and reclaimed) in November amounted to 26,155 tons, according to Board of Trade figures. Exports were 6,002 tons. Detailed figures are given below.

IMPORTS

	Nov., 1960	Nov., 1959
Nigeria	1,524	18,818
Singapore	4,468	4,587
Federation of Malaya	8,743	8,890
Ceylon	681	647
British North Borneo	291	293
Sarawak	1	50
Canada	2,327	1,858
Other Commonwealth Countries and Irish Republic	186	113
France	—	31
Burma	—	5
Vietnam	866	75
Indonesia	842	553
USA	2,293	2,234
Other foreign countries	3,933	1,294
Total	26,155	39,448
Rubber latex	1,583	2,540
Other raw, including crepe	19,069	15,467
Balata	68	145
Chewing gum base	—	—
Synthetic rubber	3,528	3,611
Others	1,637	1,224
Total	25,885	22,987

EXPORTS

Commonwealth countries and Irish Republic	1,541	1,668
West Germany	337	171
Spain	1,073	331
USA	—	—
Other foreign countries	3,051	2,404
Total	6,002	4,574
Synthetic and reclaimed	2,930	2,156
Waste rubber	3,072	2,418
Total	6,002	4,574

United States

November 1960 consumption of natural rubber (except latex) in USA was 31,627 tons against 32,750 in October. Consumption of latex amounted to 4,338 tons against 4,283 in October, according to the Department of Commerce.

Stocks of natural rubber at the end of November stood at 62,324 tons against 65,842 a month earlier, latex stocks totalled 9,284 tons against 10,634 tons.

Reclaimed rubber production in November totalled 21,014 tons against 23,269 in October, and consumption of synthetic rubber amounted to 86,179 tons against 88,784 tons.

Production of synthetic rubber was 87,540 tons in November compared with 109,991 tons in October and synthetic rubber stocks stood at 240,035 tons (238,231 in October).

Japan

The Japanese Rubber Importers' Association has announced that Japan's consumption of crude rubber during November amounted to 12,500 tons, compared with 13,000 tons in October. The association said the domestic consumption of crude rubber in December was estimated at 12,500 tons.

The end-November stocks of crude rubber amounted to 15,750 tons, compared with 16,250 tons in October. The end-December crude rubber stocks were estimated at 15,250 tons.

Japan's imports of crude rubber during November totalled 12,000 tons, compared with 12,610 tons in October. The December import of crude rubber was estimated at 12,000 tons.

The Japan Rubber Manufacturers' Association has announced that output of rubber articles during October amounted to 18,743 tons, compared with 18,305 tons in September.

Malaya

Malayan shipments of sheet and crepe during November totalled 86,291 tons, compared with 77,070 tons in the previous month. The UK took 9,992 tons, USA 7,779 and Russia 20,725 tons.

Shipments of latex and revertex during November amounted to 7,533 tons. The October figure was 9,183. A breakdown of the shipment figures is given below.

SHIPMENTS OF SHEET AND CREPE

United Kingdom	9,992
USA	7,779
France	5,175
West Germany	5,430
Italy	4,657
Netherlands	1,128
Russia	20,725
Sweden	1,943
Other countries in Europe	10,316
U ion of South Africa	929
Canada	2,016
Hong Kong	86
Australia	1,425
Other British Possessions	2,856
Japan	5,393
China	—
Other countries	6,441
	86,291

SHIPMENTS OF LATEX AND REVERTEX

United Kingdom	1,534
USA	1,880
Continent of Europe	2,389
British Possessions	456
Other countries	1,274
	7,533

Anti-dumping Application Withdrawn

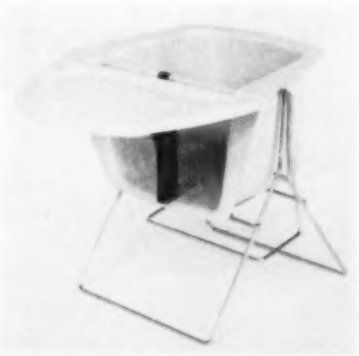
The Board of Trade have been considering an application for the imposition of anti-dumping duties on vinyl acetate monomer imported from Italy and Switzerland.

It is now announced that the application has been withdrawn.

Ekco Newcomers

Two new products — a baby chair and a baby bath — were introduced to the Ekco Plastics 'Gold Seal' range of nurseryware at the Nursery Goods exhibition in London, which closed yesterday (January 6).

The baby chair (pictured) can be used either as a high chair or a combined low chair/car seat by means of two alternative quickly detachable chromium plated stands. The seat, with an adjustable foot-rest and detachable tray is moulded in polypropylene.



The baby bath is moulded in rigid high-density polythene and has carrying handles at either end.

Petrothene Resins Guide

A four-page data sheet listing the most commonly-used Petrothene polythene resins, their main characteristics, and their predominant applications, has been published by US Industrial Chemicals Co. Several of the many available compounded resins are also listed.

Called PRTD-1, this data sheet provides a general guide; it is not a listing of all Petrothene polythene resins or all possible applications.

Ridged Belting

A new Goodrich conveyor belt with moulded ridges is said to carry wet or dry materials up steeper inclines than its predecessors. The ridges prevent 'fall back' of materials.

The belt, called the 'Ridgelock' is designed primarily for wood chip handling in paper mills but it can also carry sand or gravel.

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An associate of H. Muehlstein & Co. Inc.,
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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Metal Coated Fluorocarbons

No. 853,422. George Angus and Co. Ltd. Application, May 30 1958. Filed, May 28 1959. Published, November 9 1960.

PTFE and other fluorocarbon resins are not easily bonded, and the invention describes a method of coating these materials with copper or other metals. Sheets of this coated plastic may be used as a base for printed circuits or articles so coated may be formed as by adhesive or soldering to other materials with which the metal will make a satisfactory bond.

A thin metal layer is formed on a carrier from which it may subsequently be easily removed, and the fluorocarbon material is moulded under pressure against the metal layer. On removal of the carrier the metal is left adhering to the fluorocarbon. A fluorocarbon may be coated on one or both sides by the process.

Glass Fibre Mouldings

No. 853,386. Clifford Charles Arthur Edey. Application, August 21 1957. Filed, November 21 1958. Published, November 3 1960.

A method of manufacturing a pre-stressed moulding from resin and glass fibre. This consists of forming a double layer of parallel lengths of glass fibre rovings, interleaving fibre glass mat between and outside the rovings, cementing the end regions of the assembly and forming a roll thereof, impregnating the roll in a mould with a suitable impregnant whilst the rovings are in a stressed condition, allowing the impregnant to and removing the pre-stressed moulding so formed.

Rubber Latex Adhesives

No. 853,572. Dunlop Rubber Co. Ltd. Filed, June 27 1957. Application, June 30 1956. Published, November 9 1960.

A limitation to the use of rubber latex adhesives is the relative slowness of bonding compared with say rubber solutions or starch and dextrine adhesives. On the other hand the bonds obtained are strong, as the rubber has not been broken down on the mill. A method of preparing latex adhesives which quickly form strong durable bonds and yet are capable of being stored and transported satisfactorily is described. This comprises adding a proteolytic enzyme to a latex, digesting the latex therewith and then adding a restabilizer to the latex. Restabilizers preferred are the cellulose ethers. Examples of proteolytic enzymes which can be used include trypsin, erepsin, pepsin and papain. The proportion used is small, from 0.01 to 0.1phr, but this is not critical.

Polymerization of Propylene

No. 853,594. E. I. du Pont de Nemours and Co. Application and Filed, April 30 1957. Application in USA, May 10 1956. Published, November 9 1960.

It has been discovered that preparation of a limp, flexible polymer of propylene of low crystallinity and having greatly improved strength, toughness and resiliency, can be accomplished by a new process. This comprises the polymerization of propylene in perchloro-ethylene, orthodichlorobenzene or monochlorobenzene in the presence of a co-ordination catalyst.

The resulting polymer is then precipitated by the addition of methanol or other inert oxygenated organic liquid. The improved product is not a fraction which remains in solution but is instead the precipitated polymer, which is virtually the entire polymeric product formed during the polymerization. Moreover this precipitate, having improved strength, toughness and resiliency, is only partially crystalline.

Polypropylene Film

No. 853,637. Montecatini. Application and Filed, March 25 1957. Application in Italy, March 30 1956. Published, November 9 1960.

Crystallizable polymers of propylene which have an intrinsic viscosity, as determined in tetrahydronaphthalene at 135°C., greater than 2 can be processed to form films only with difficulty under the temperature and pressure conditions which are usual in melt extrusion and similar shaping operations. It has been found necessary to apply a controlled degradation process to the polymers to make them easier to process. The process described makes possible film formation directly from crystallizable polymers of propylene of high intrinsic viscosity. The product has better electrical and mechanical properties than films made from degraded polymers.

A solution of polymer in a volatile solvent is delivered onto a solid casting surface in a layer, the solvent is removed by heating and the film so formed is stripped from the casting surface. Molecular orientation is then imparted to the film by stretching it at elevated temperatures in two directions at right angles. This process may be applied to the production of films not only in the form of wide flat sheets but also in the form of tubes or tapes.

Display of Vanitory

An exhibition of Vanitory Units is being held in the Formica showrooms at De La Rue House, Regent Street, London. A representative selection of production-line models from leading manufacturers is on view, together with two 'Do-It-Yourself' units.

Also on display are two packaged units, the component parts of which have already been cut out and are ready to assemble. The exhibition will run for several weeks.

Sleeper Insert

The Institute for the Plastics and Rubber Industry at the Technical University, Budapest, together with specialists of the Hungarian Railway Company, have started experiments to find a suitable reinforced plastics insert for railway sleepers. Recently the prototype of a sleeper with such an insert was produced.

This was found to be a perfect electric insulator, and was resistant to temperature variations. In fatigue testing equal to 50-60 years of service, steel bolts and rails suffered excessive wear, but the plastics insert was said to be comparatively unaffected.

At the International Boat Show, which is now on at Earls Court, London, Ciba (ARL) Ltd. is showing synthetic resin adhesives for boat building. A new resorcinol adhesive, Aerodux 500, has been introduced at the show. This is a two-liquid system that has been developed to facilitate mixing and spreading, to prevent rapid 'drying-out', and to improve curing properties at low temperatures. Also featured are boat moulds, such as this 16ft. Araldite mould, made by Healey Marine Ltd.

COMPANIES IN THE NEWS

BIP Consider Rights Issue

THE raising of additional funds, possibly by a rights issue, is being considered by British Industrial Plastics.

The September 30 1960 group balance sheet shows that bank balances fell during the year from £611,222 to £236,443, some £275,000 in income tax has fallen due since, and there were capital outlay commitments of £324,000.

Capital expenditure in 1959-60 was some £684,000 — in the two years since September 1958 the last time any fresh money was raised, about £1,275,000 has been spent.

C. H. Glassey, chairman, recalls his statement last year that a number of projects were under review, and that should these be adopted and when plans for their implementation were complete, it would then be necessary to raise new capital.

The increase in group profit, before tax, from £802,916 to £1,132,819 for 1959-60, was made possible by a rise from £7,871,653 to £9,201,543 in turnover. The year's dividend is effectively increased by 4¼% to 16%.

Mr Glassey, referring to the announcements of approaches for a possible merger and the subsequent abandonment of negotiations, says the directors consider their programme of expansion and development would not have been accelerated by any of the proposals so far made to them.

They are of the opinion, he adds, that it is desirable for the company to remain an independent entity unless some considerable commercial and technical advantages would be derived from a merger.

Year-end group fixed assets and investments totalled £2,718,915 (£2,336,039) and net current assets were £1,939,097 (£1,763,130).

Turner and Newall

In a statement to shareholders R. G. Soothill, chairman of Turner and Newall Ltd., says that the satisfactory trading results for the year to September 30 1960 make possible a final dividend of 9½%. With the interim dividend this makes a final distribution of 12%, compared with 10% in 1959.

The statement adds that Turner Brothers Asbestos Co. Ltd. fully maintained its position as one of the leading suppliers of fire-resistant conveyor belting to the National Coal Board, and that the trading activities of J. W. Roberts Ltd. expanded satisfactorily during the year. A 'substantial increase' was achieved in 'Ferobestos' and 'Feroglas' reinforced plastics, while further advances were made with

Continued on page 31

Rubber and Plastics Share Prices

Par Value	Company	1960 High	Low	Dec. 17	Latest
£1	A.E. Ind. Ord.	67/-	39/-	39/6	40/-
5/-	Albright & W. Ord.	34/3	25/-	26/9	25/3
£1	,, ,, ,, 5% Pref.	17/3	15/3	15/6	15/6
5/-	Anchor Chemical Ord.	18/7½	14/9	16/-	15/9
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	60/6	34/9	58/9	58/6
5/-	Ault & Wiborg Ord.	28/-	20/-	26/9	27/3
£1	Avon India Rubber Ord.	46/6	30/-	30/-	30/7½
£1	,, ,, ,, 6% Pref.	20/-	17/6	18/9	18/9
10/-	Bakelite Ord.	62/6	39/9	44/-	43/-
£1	,, 6% Pref.	19/3	16/9	18/-	18/-
£1	Baker Perkins Ord.	46/6	40/-	42/-	43/1½
4/-	Bank Bdg. Rubber Ord.	4/3	2/3	2/6	2/-
4/-	Bettix	—	—	7/7½	8/3
4/-	Brammer H. Ord.	18/6	16/9	16/9	16/10½
10/-	Bridge, David Ord.	66/6	50/-	58/9	50/-
5/-	Bright, John Ord.	18/6	14/3	14/9	14/4½
5/-	Brit. Blting. & Asb. Ord.	—	—	18/7½	18/-
£1	,, ,, ,, Pref.	—	—	15/9	15/9
2/-	Brit. Ind. Plas. Ord.	12/1½	5/3	8/9	8/9
2/-	,, 10% (tax free) Pref.	4/9	4/3	4/6	4/9
£1	British Xylonite Ord.	67/-	50/6	60/6	63/6
£1	,, ,, 5% Pref.	18/9	14/-	14/6	15/-
£1	BICC Ord.	61/3	47/6	48/6	49/3
5/-	BTR Ind. Ord.	17/9	9/9	14/9	15/-
£1	,, ,, 7½% Pref.	24/3	21/3	21/9	22/3
5/-	Cole, E. K.	31/9	18/-	18/9	20/-
£1	Courtaulds Ord.	59/4½	42/-	42/-	43/9
£1	,, 5% 1st Pref.	17/9	15/-	15/3	15/6
£1	,, 6% 2nd Pref.	21/-	18/-	18/3	18/6
4/-	Cow, P. B. Ord.	9/9	6/9	7/9	8/-
£1	,, ,, 5% Pref.	15/6	14/-	14/6	14/-
1/-	Dannimac Mfg. Ord.	14/6	9/-	11/9	12/9
10/-	De La Rue Ord.	78/6	47/9	54/4½	58/1½
£1	,, ,, ,, 3½% Pref.	12/-	10/-	10/6	10/-
10/-	Distillers Co. Ord.	46/-	32/9	39/-	39/6
£1	,, ,, 6% Pref.	22/-	19/6	20/-	20/-
£100	,, 5% Conv. Loan	£96	£93½	£94	£93½
£100	,, 5½% Unsec. Loan	£97	£85½	£86	£85½
10/-	Dunlop Rubber Ord.	30/6	19/9	20/-	22/-
£1	,, ,, 5½% Pref.	19/-	16/-	16/3	16/-
£100	,, 3½% 1st Debs.	£78	£68	£70	£68
£100	,, 4½% 2nd Debs.	£87	£77½	£77½	£79½
£1	Eng. Elect. Ord.	53/6	30/9	31/-	34/9
4/-	Ebonite Cont. Ord.	14/3	8/3	9/9	8/4½
£1	English China Clays Ord.	95/-	69/-	86/-	84/6
£1	Goodyear Tyre 4% Pref.	12/9	10/9	11/6	11/6
5/-	Greeff Chem. Ord.	35/-	23/-	25/-	23/-

Par Value	Company	1960 High	Low	Dec. 17	Latest
10/-	Greeff Chem. 5½% Pref.	9/-	8/-	8/-	8/-
5/-	Hackbridge Hldg.	8/7½	5/3	5/7½	6/-
4/-	Greengate & Irwell Ord.	6/6	5/3	5/6	6/-
£1	Harrisons & Crosfield Dd.	64/-	48/9	50/3	49/-
1/-	Hunt & Moscrop Ord.	2/9	1/6	1/7½	1/7½
£1	Imp. Chem. Ord.	75/3	54/3	65/3	64/9
£1	,, ,, 5% Pref.	18/-	15/6	15/9	15/9
£100	,, 4½% Unsec. Loan	£89½	£80½	£81½	£81½
£100	,, 5½% Conv. Loan	£212½	£90xc	£93	£92½
1/-	Kleemann (O. & M.) Ord.	11/6	8/3	9/-	9/-
£1	,, ,, 6½% Pref.	19/-	17/-	17/-	17/-
5/-	Laporte Ind. Ord.	33/6	21/3	27/-	26/3
£1	,, ,, 7½% Pref.	24/3	23/-	23/3	23/3
£1	Leyland & Birm. Rubber Ord.	63/-	46/3	47/-	48/-
£1	,, ,, ,, 6% Pref.	19/-	17/6	17/6	18/1½
2/-	London Rubber	14/9	11/-	14/-	14/6
£1	,, 6% Red. Cum. Pref.	20/-	18/-	18/6	18/6
£1	McKechnie Bros. Ord.	71/6	57/-	59/-	59/-
£1	,, ,, 'A' Ord.	69/3	55/-	55/-	55/-
£1	,, ,, 6% Cum. Pref.	18/-	16/-	17/-	17/-
5/-	Monsanto Chem. Ord.	31/-	23/-	25/6	25/6
£1	,, ,, 3½% Pref.	12/9	12/-	12/-	12/-
£100	,, ,, 6% Debs.	£103½	£97½	£99	£98
5/-	Miles (H.G.) Holdgs. Ord.	11/3	8/9	8/9	8/1½
£1	North British Rubber	21/3	16/-	17/1½	16/6
5/-	Northwestern Rubber	13/-	9/-	12/-	13/-
5/-	Plastic Enginrs. Ord.	30/-	20/-	28/9	28/-
5/-	Redfern Holdings Ord.	5/9	3/1½	3/4½	3/4½
2/-	RFD Ltd. Ord.	6/6	3/4½	3/7½	4/-
£1	,, ,, 5½% Pref.	14/6	12/9	13/9	13/9
2/-	Rubber Imp. Ord.	7/9	3/1½	3/6	3/6
2/-	,, ,, 'A' Ord.	7/-	3/-	3/-	3/3
£1	,, ,, 5% 1st Pref.	15/-	11/3	12/3	12/3
5/-	Rubber Reg. Ord.	19/3	16/9	16/9	16/9
4/-	Shaw Francis Ord.	27/6	17/3	17/3	19/-
2/-	Silentbloc Ord.	13/3	8/6	8/7½	8/6
5/-	Storey Bros.	41/9	28/3	35/-	35/-
2/-	Sussex Rubber Ord.	2/3	1/3	2/-	2/-
5/-	Sutcliffe Speak Ord.	15/9	11/-	14/-	14/-
£1	Turner & Newall Ord.	60/10½	48/3	52/9	55/-
£1	,, ,, ,, 7% Pref.	25/-	21/9	22/1½	21/10½
5/-	Universal Asbestos Ord.	50/-	24/-	24/6	24/3
5/-	Viscose Dev. Ord.	16/6	14/9	16/-	16/-
5/-	Warne W. (Holdgs.) Ord.	18/9	14/9	15/-	15/-

Rubber Markets

LONDON

End-of-year squaring of accounts aided a recovery movement, especially as sellers were disinclined to offer freely. Factory interest was at a low ebb. The market made a further advance following higher levels at Singapore. Uneasiness over the Laos situation brought out more covering business in an otherwise quiet market at the reopening after the New Year holidays.

Latest prices are as follows:

No. 1 RSS Spot: 26⅜d.-26⅝d.

Settlement House:
February 26½d.-26⅝d.
March 26⅝d.-26⅞d.
April/June 26¼d.-26½d.
July/September 26⅝d.-26⅞d.
October/December 26⅝d.-26¾d.
January/March (1962) 26d.-26¼d.

No. 1 RSS cif basis ports:
January 26d.-26¼d.
February 26d.-26¼d.
March 26d.-26¼d.

Godown:
January 87⅜ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, January, 14s. 8d., cif European ports. Spot, seller, 15s. 4d. Bulk, seller, d.w. 14s. 7d. nominal. Creamed, seller, 14s. 5d. nominal, January. Normal, seller, January, 12s. 9d.

NEW YORK

The New York rubber market ruled as under on January 3:

DEALERS' PRICES

	US cents per lb., ex-dock	
	Jan. 3	Previous
No. 1 RSS, Jan. ..	29¼b–29⅜a	28¾a
Feb. ..	29½b–29⅝a	29a
No. 2 RSS, Jan. ..	29⅛b–29¼a	28⅞a
Feb. ..	29⅛b–29¼a	28¾a
No. 3 RSS, Jan. ..	29⅛b–29⅜a	28¾a
Feb. ..	29⅛b–29⅜a	28⅞a
No. 1 RSS, Spot ..	29⅜n	28¾a
No. 3 amber blanket crepe, Jan. ..	25⅞n	25⅜n

FUTURES—REX CONTRACT

	Jan. 3	Prev. Close
Jan. ..	29.65b–29.85a	28.89t
Mar. ..	29.80t	28.90b–29.05a
May ..	29.80t	29.00b–29.10a
July ..	29.80b–29.90a	29.00b–29.10a
Sept. ..	29.80b–29.95a	29.00b–29.10a
Nov. ..	29.85b–30.00a	29.00b–29.10a
Jan. ..	29.85b–30.00a	29.00b–29.10a

Sales: 89. Tone: Firm.

Rubber features were stronger on January 3, up about a cent per lb. on covering reflecting the advance abroad. Early dealings were fairly active. Traders said the crisis in Laos was inducing covering. Later in the day slight paring of extreme gain was noted on light profit-taking, but the undertone continued quite firm. Physical rubber was termed by traders quiet and firm. In the closing stages, futures held firm in fair dealings. Traders reported a modest business in physical rubber.

AMSTERDAM

The Amsterdam rubber market ruled as under on January 3:

	Guilders per kilo	
No. 1 RMA	Jan. 3	Previous
January	2.50	2.50
February	2.50	2.50
March	2.50	2.50
Jan. March	2.50	2.50
April	2.50	2.50
May	2.50	2.50

Sales: Nil. Tone: Quiet.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on January 3 was 27.25 (27.25) US cents per lb.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on January 3 was 98 Ceylon cents per lb.

SINGAPORE

The market advanced steadily throughout the morning of January 3 on short-covering reflecting the Laos situation. Demand for lower sheet was fair and sellers were reserved. Factories showed little interest. In the afternoon, prices tended to ease in thin trading. Interest in lower sheets was limited. After hours, the market was slightly easier.

	Malayan cents per lb., fob Malayan ports to open ports	
	Jan. 3	Prev. Close
No. 1 RSS, January	88½–88¾	86½–86⅞
February	88⅜–88⅞	86¼–87
No. 2 RSS, January	87½–88	85½–86½
No. 3 RSS, January	85⅜–86½	84¼–84¾
No. 4 RSS, January	82¾–83¾	81¼–82¼
No. 5 RSS, January	75 –76	73½–74½
No. 1 RSS, Spot ..	88¼–88¾	86⅛–86⅞
No. 3 blanket thick remilled crepe, Jan.	72½–73½	71 –72
No. 1 fine pale crepe, Jan.	91¾–93¾	89½–91½
2x thin brown crepe, Jan.	71¾–72¼	70½–71½

Tone: Slightly easier.

DJAKARTA

The market was quiet on January 3 as most offices are still closed.

	Rupiahs per kilo	
	Jan. 3	Previous
Spot No. 1 priok ..	30.25b	30.00b
Spot No. 2 priok ..	29.25b	29.00b
Spot No. 3 priok ..	27.50b	27.25b
No. 1 fine pale crepe, spot	30.00b	30.00b

Tone: Quiet.

COMPANIES in the NEWS

Continued from page 30

sprayed 'Limpet' asbestos in various important overseas markets.

Dunlop Exports Up

Dunlop exports for the first nine months of 1960, at more than £14m., were up 13% on the corresponding period in 1959. Over the same period, UK exports as a whole rose by 8.5%.

Major markets are in the Middle East and Africa, but 150 countries are on the current Dunlop export list.

These figures do not include indirect exports.

Sembilan Accept Offer

The directors of the Sembilan Estates Company intend to accept the offer from Highlands and Lowlands Para Rubber Company for their holdings totalling 3,025 shares, and recommend shareholders to do the same.

In the formal offer it is stated that Sembilan shares will be purchased as from July 31 1959. Sembilan has already paid an 8% interim, and the Highland's board envisages a final divided of not less than 27½% on its increased capital, payable about June.

The offer remains open until January 24.

Bruas Liquidation

As the sale of the estates has now been completed and net proceeds received in this country, the directors of Amalgamated Bruas Rubber Estates recommend immediate liquidation.

At present, estimated surplus assets available for distribution will be approximately 14s. per 2s. unit, subject to liquidation costs, but allowing for payment of £14,950 in compensation.

Rubber Study Group

The International Rubber Study Group was formed by the Netherlands, the UK and USA in 1944. France joined later, in 1945, and not in 1954, as stated in our announcement of the retirement of A. G. Pawson from his position as Secretary-General of the Group (*RJIP* Dec. 31, 1089).

Crop Returns

SHARPE, ESTALL

Anglo-Johore.—31 (28). 5 mths—188 (173).
Bekoh CRE.—218 (214). 8 mths—1,657 (1,619).
KPRP.—61 (46). 8 mths—523 (487).
Rim (Malacca).—254 (244). 5 mths—1,307 (1,148).
Kur Unegala.—29 (32). 11 mths—303 (281).
Sittang Valley.—85 (176). 5 mths—274 (403).

Beau Sejour.—62 (55). 5 mths—319 (279).
Central Sumatra.—12 mths—833 (1,012).
Inch Kenneth Kajang.—238 (228). 11 mths—2,484 (2,286).
Kuala Reman.—96.

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RL53

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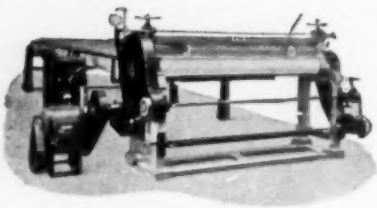
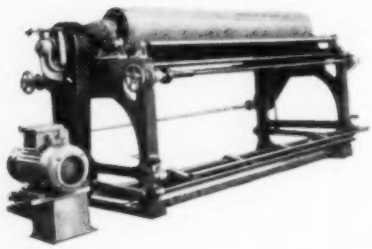
Latex Engineering Co



Motor Driven Spreader



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Industry INTELLIGENCE

Technical Data

Sarrac ABS Sheet

The latest product to be developed by Saro Products Ltd., makers of Savoy toughened polystyrene sheeting, is a rigid type H ABS extruded sheet known as Sarrac.

Available in a wide range of sheet sizes and thicknesses, the material can be thermoformed by any of the accepted processes and has good chemical resistance. The ease of forming and the excellent thermal, abrasion resistant and impact properties make ABS materials suitable for a great many applications. These include automobile parts such as battery trays and fittings, machine guards, office machine components and many domestic uses for radio and television sets, components for washing machines, refrigerators, and vacuum cleaners, and for toys and luggage.

A preliminary information sheet on this product is available from Saro Products Ltd., Folly Works, East Cowes, Isle of Wight.

Scarlet Chrome Pigments

Technical leaflets SC 851,852 and 852 issued by I.C.I. Ltd., give details of the grades of scarlet chrome pigments available. These are YS, LYS and FMS which do not conform to the 5% soluble lead requirement when tested to BS 282:1953, and two modified brands H-YS and H-LYS which are for most purposes interchangeable with the unmodified types but which do meet the limits imposed by BS 282.

These pigments have good hiding power and weather fastness and are of special interest in the formulation of industrial stoving finishes. They are also of value in roller-coating enamels and printing inks and for the mass-coloration of linoleum and linoleum paints.

Heat fastness in plastics is generally good, although colours tend to become duller at the higher temperatures employed, and the pigments can be used for PVC, polythene and polystyrene without tendency to migrate.

Iridon PVC

Several grades and qualities of PVC sheeting are available from Iridon Ltd., 75 Grosvenor Street, London, W.1 (one of the Commercial Plastics Group of Companies) and the latest addition to the range is rigid material.

Types M.173, 174 and 175 are all suitable for vacuum forming. The first of these is a high impact grade, the second is a translucent grade for lighting applications and M.175 is a general purpose vacuum forming grade. Each of these grades is available in the form of calendered sheets, rolls, and pressed sheets.

M.200 is a chemical grade sheeting of high physical strength, and with excellent physical characteristics and a high degree of resistance to chemicals. Thinner gauges can be vacuum formed but the material is not suitable for deeply drawn or sharply detailed articles.

Iridon extruded PVC is a vinyl copolymer sheeting available in a wide range of colours, thicknesses and sheet sizes. The material is ideal for large-scale vacuum forming applications, combining good surface finish with a price range below that of press polished and laminated sheets.

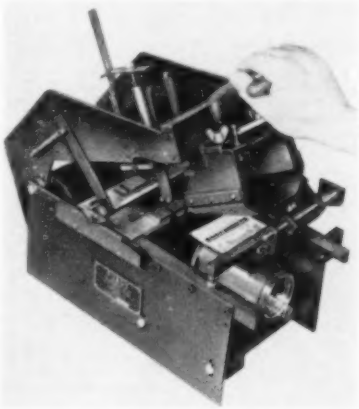
Technical information, data sheets and samples of these materials are available from the address given above.

Machines, Materials and Equipment

Labelling Machine

A small hand-operated machine has recently been introduced by the Purdy Machinery Co. Ltd. This is capable of labelling flat, square, oval and polygonal shapes as well as round, with a minimum of trouble where change over is concerned.

With one pull of the handle it actuates the full labelling cycle. This consists of gumming a static picker



plate, picking a label from the label magazine, transferring the label to the bottle or container and wiping it securely in position.

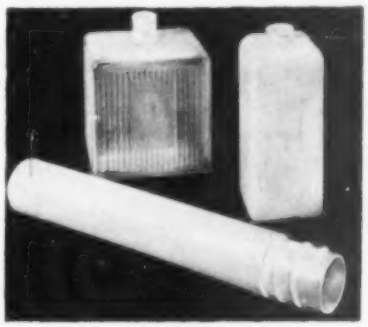
This machine is completely portable, easy to move and easy to clean. All parts are readily accessible and the gum box, situated below the picker plate, can be quickly removed for servicing. Known as the Prestofix, the machine will label bottles or containers of from 2¼ to 3in. diameter, label sizes being from 1½ to 3½in. deep by from 2 to 4½in. wide.

Blowmaster

Coinciding with the opening of their new factory, Fibrenyle Ltd. have just installed the first of three Blowmaster Type 10 blow moulding machines.

These machines can produce large polythene containers automatically.

Capable of producing containers of up to 9in. diameter by 20in. high



these machines make possible a high rate of production at economic prices.

The illustration shows three typical examples. That in the foreground is 20in. long by 3in. diameter, to the right (in HD polythene), is 4in. square by 10in. high and to the left (thin wall), 7in. square by 9in. high.

Publications

Flotation in Paints

Flotation is a phenomenon which has troubled the paint industry for many years, and no remedy has been found which is applicable in every instance.

A booklet recently issued by British Titan Products Co. Ltd., is a reproduction of a paper which appeared in *The Journal of the Oil and Colour Chemists Association.*

This draws attention to some of the factors affecting the phenomenon. It explains why 'cures' sometimes work and sometimes fail. It points out how changes in atmospheric conditions over which neither paint user nor manufacturer has any control may cause flotation to appear or disappear.

Although the author of the paper has not discovered a universal cure it is encouraging to technologists to know that the problem is being tackled and that understanding of this complex phenomenon is improving.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in RUBBER JOURNAL AND INTERNATIONAL PLASTICS *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. C.i.f. duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cifUKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, resin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)
(min., 70,000-lb. lots)

1000/1	Hot, Non-Oil	23.1
1002/6/7	,, ,,	23.34
1009/11	,, ,,	23.71
1012	,, ,,	23.24
1013	,, ,,	23.94
1500/1/2	Cold, Non-Oil	23.1
1703	COE, 25% Oil	*20.31
1705	,, ,, ,,	*20.07
1707/8	,, 37.5% Oil	*18.89
1710/12	,, ,, ,,	*18.66

*Under 70,000 lb., min. 600 lb.

ASRC (American Synthetic Rubber Corpn.) (e-sUK)

1004/6	Hot, non-oil	22.25
1009	,, ,,	24.0
1018	,, ,,	24.75
1019	,, ,,	24.5
1500/2/7	Cold, non-oil	22.25
1503	,, ,,	24.25
1703	COE	20.5
1708	,,	18.0
1712	,,	17.75
1713	,,	16.75
3014	Hot, non-oil	25.75
3105/6	Cold, non-Oil	22.25
3110	,, ,,	24.0

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,,	23.375
S-1006	,,	22.25
S-1009/11/13	,,	24.0
S-1500/2/9	Cold	22.25
S-1600/2	CBM	19.625
S-1605	,,	19.375
S-1606	,,	18.75
S-7652	,,	20.0
S-1703	COE	19.25
S-1707	,,	18.0
S-1709/12	,,	17.75
S-1803	COBM	17.875
S-1806	,,	16.625
S-1807	,,	17.375
S-1808	,,	15.25

FR-S (Firestone) (delUK*)

1000/1/4/6/7 and 195	Hot	22.50
1500/2 and 146	Cold	22.50
1703 and 173	OE	19.11
1710/12 and 184	,,	18.00
178	,,	18.25
201	,,	16.71
1009 UK Specialty		23.06
1012 ,,	,,	22.59
1013 ,,	,,	23.59
1014 ,,	,,	26.18
181 ,,	,,	22.50
182 ,,	,,	23.29
147 ,,	,,	20.94
158 ,,	,,	28.00
158-S		27.50

*Import Duty not included

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	23.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical) (e-sUK)

1016	28.0
1018	28.5
1019	28.0
1022	31.0
1023	32.75
1503	27.75
1504	34.5
6101	26.25
6102	27.75
K-45	30.75
K-50	31.5
KO-50	29.0
6003	28.5
6100	32.25

ANIC (e-qdp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75

Philprene (Phillips) (d)

1000/6	Hot, non-pig.	22.50
1009	,, ,,	24.25
1018	,, ,,	26.97
1019	,, ,,	26.50
6701	,, ,,	24.23
1500/2	CNP	22.50
1503	,,	26.27
6630	,,	25.18
6632	,,	24.23
1601	CP	19.70
1603	,,	19.80
1605	,,	19.625
1606	,,	19.00
1608	,,	18.90
1609	,,	21.12
6662	,,	18.90
6655	,,	19.80
1703	COE	20.75
1708	,,	18.25
1712	,,	18.00
6700	,,	18.01
1803	CPOE	18.125
1805	,,	16.11
1808	,,	16.50
6608	,,	15.27
6753	,,	15.61
6754	,,	15.45
6755	,,	17.68

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,,	17.75
1773	COELC	19.25
1778	,,	18.0
B—6		27.5
B—5		28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,,	22.47
1006/7	,,	22.25
1009	,,	22.81
1012	,,	22.38
1013/61	,,	22.25
X274	,,	23.45
8000	,,	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,,	18.0
1711	,,	17.88
1712	,,	17.75
8200	,,	18.0
8201	,,	16.6
8202	,,	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,,	15.84
8254	,,	15.45
8255	,,	14.8
8267	,,	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cifUKdp)
(10-ton lots)

2101	(dw)	46.3
X-765	,,	40.8
X-800	,,	37.2
2102/5	,,	38.0

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A	(dw)	44
150	,,	50
151	,,	35
160	,,	50
170	,,	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/F28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cifUKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,,	50
B	MLN	51
BJ	,,	51
BLT	,, Cold	51
BJLT	,, ,,	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT		51
OZO		47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Butaprene N (Firestone) (cifUKdp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,,	60
245	B ,,	52
245/6/7/8	CHS ,,	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, (carboxyl)	60
1562	MHN	52
1577	(modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215		21.75
Regular 217/8		21.75
Regular 325		21.75
Non-staining 165		22.75
Non-staining 268		22.75
Non-staining 365		22.75

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

(ddp)

W	(dwdel)	42.62
WHV	,,	38.5
WRT	,,	48.37
WX/GN/GNA	,,	44.62
GRT and S	,,	45.62
AC	,,	57.125
KNR	,,	75.62
AC 'M' and 'S'	,,	57.125
CG/AD	,,	57.125

The above prices refer to neoprene produced in the U.S.A. Prices of neoprene types produced at Du Pont's Maydown, Northern Ireland, plant are as follows:

W	(dwdel)	38.5
WRT	,,	44.0
WX	,,	40.5

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	27.75

Cyclite (Durham Raw Materials) 42

HYPALON

(ddp)

20	48
30	60.25
40	50.75

Future Events

Institution of the Rubber Industry

London Section.—Jan. 10, at the Royal Society of Tropical Medicine and Hygiene, Manson House, 26 Portland Place, London, W.1, at 5.30 p.m. 'Rubber Bonded Non-Woven Fabrics,' by S. C. Stokes, A.I.R.I. (Rubber Technical Developments Ltd.). At 7 p.m., 'Recent Developments in Butyl Rubber,' by R. L. Zapp (Esso Research).

Manchester Section.—Jan. 9 at Newton Heath Technical College, Manchester, at 6.45 p.m. 'Hose,' by C. Wynne Evans, A.R.T.C.S., A.I.R.I. (Dunlop Rubber Co. Ltd.). Jan. 13 at Belle Vue, Manchester. Annual dinner/dance.

Merseyside Section.—Jan. 9 at the Exchange Hotel, Liverpool, at 7.30 p.m. 'Safety in the Rubber Industry,' by H. Jackson, M.Sc. (Leyland and Birmingham Rubber Co. Ltd.), D. G. Lamb (RABRM) and S. F. Smith (Dunlop Rubber Co. Ltd.).

Midland Section. — Jan. 9 at the James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.45 p.m. 'A New Look at Factice,' two short papers by Dr C. Falconer-Flint and A. H. Clark, B.Sc., D.R.C.S.T. (Factice Research and Development Association).

North-Eastern Section.—Jan. 9 at the Eldon Grill, Newcastle, at 7 p.m. 'Rayon,' by E. V. Reeves, B.Sc., A.Inst.P. (Courtaulds Ltd.).

Preston Section.—Jan. 9 at the BTR Industries Social Club, Farington, Preston, at 7.15 p.m. 'Natural Rubber v. Synthetic,' a debate with invited speakers by NRPRA and Synthetic Producers.

Southern Section. — Jan. 11 at the Polygon Hotel, Southampton, at 7.30 p.m. 'Ageing and Weathering of Rubber and Some Plastics,' a joint meeting with the Plastics Institute, by Dr W. McG. Morgan (Monsanto Chemicals Ltd.).

West of England Section.—Jan. 11 at George Hotel, Trowbridge, at 8 p.m. 'Using SBR to Advantage,' by A. Mekel and P. G. Bourne (Shell Chemical Co. Ltd.).

Plastics Institute

London and District Section.—Jan. 12 at the Criterion in Piccadilly. Annual dance.

Midlands Section.—Jan. 13 at the Grosvenor House Hotel, Birmingham. Tripe and onion supper.

South Wales and Monmouthshire Section.—Jan. 11 at the Angel Hotel, Cardiff, at 6.30 for 7 p.m. 'Injection Moulding,' by G. Campbell, B.Sc., A.R.I.C. (Imperial Chemical Industries Ltd.).

Western Section.—Jan. 11 at Stroud Technical College, at 7 p.m. 'Plastics in Packaging — Present and Future Trends' by D. B. Bowman, B.Sc. (Metal Box Co. Ltd.).

Yorkshire Section.—Jan. 11 at St. Mark's House, 186 Woodside Lane, Leeds 2, at 7.15 p.m. 'Bottle Blowing Techniques,' by D. B. Bowman (Metal Box Co. Ltd.).

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

FIBRON (B801,925) Plastics in the form of liquids and powder. Ronuk Ltd., Portslade, Sussex. (Class 1; December 14 1960).

FEESPEED PLUS (804,951) Plasticing agents and frost-proofing agents, all being chemical products for addition to cement, plaster and the like materials. Feb (Great Britain) Ltd., Albany Road, Chorlton-cum-Hardy, Manchester, 21. (Class 1; December 14 1960).

TICKOFILM (809,836) Machines for laminating plastics on to paper, paper articles, cardboard, cardboard articles and the like. Tickopres Ltd., 7-8 Old Bailey, London, E.C.4. (Class 7; December 14 1960)

max

(B799,585) Bags and containers, all made of plastics and included in Class 16. Mondart Ltd., 49 Park Lane, London, W.1. (Class 16; December 14 1960).

DIXOPAK (809,279) Films of plastics for wrapping (packaging) purposes; and bags and containers, all made therefrom and included in Class 16. Peter Dixon and Sons, Ltd., 11 New Fetter Lane, London, E.C.4. (Class 16; December 14 1960).

NAFTOFLEX (802,786) Gutta percha, indiarubber, balata, and imitations of all these materials, and articles included in Class 17 made therefrom. Kautschuk G.m.b.H., 14 Reuterweg, Frankfort-on-the-Main, Germany. Address for service is c/o Thiemann Son and Co., Prestige House, 14-18 Holborn, London, E.C.1. (Class 17; December 14 1960).

PEPIM (806,447) Insulating materials, being expanded polystyrene plastics included in Class 17, in the form of sheets or of shaped sections. Commerce Factors (G.B.) Ltd., Gallows Park, Torpoint, Cornwall. (Class 17; December 14 1960).

PLASTIRIV (793,867) Sheet materials made of laminations of plastics, and included in Class 17. Riv. Officine Di Villar Perosa Societa Per Azioni, 53 Via Mazzini, Turin, Italy. Address for service is c/o F. J. Cleveland and Co., 29 Southampton Buildings, Chancery Lane, London, W.C.2. (Class 17; December 14 1960).

PLASTIRIVMEL (703,868) Sheet materials made of laminations of plastics, and included in Class 17. Riv. Officine Di Villar Perosa Societa Per Azioni, 53 Via Mazzini, Turin, Italy. Address for service is c/o F. J. Cleveland and Co., 29 Southampton Buildings, Chancery Lane, London, W.C.2. (Class 17; December 14 1960).

POLYVYDEX (811,038) Plastics included in Class 17 in the form of sheets, blocks, rods and tubes, being for use in manufactures. Salesmaster Shopfittings Ltd., Regent House, Dock Road, Birkenhead. (Class 17; December 14 1960).

NEW COMPANIES

Poly-Supafoam Ltd. (677,580).—December 12. Capital: £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in synthetic foam rubber, etc. The directors are: Peter E. Scarterfield, Dormans Pretoria Road, High Wycombe; Douglas J. Hann, 13 Amersham Road, High Wycombe. Regd. office: 28 Desborough Street, High Wycombe, Bucks.

A. & J. Polythene Bags Ltd. (677,558).—December 12. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in polythene bags, etc. The directors are: Adolph Schischa, The Coppice, Pasture Road, Letchworth; Joseph Stern, 48 Portland Avenue, N.16. Regd. office: 4 New Zealand Avenue, Barbican, E.C.1.

Green Plastic Packaging Co. Ltd. (677,503).—December 12. Capital: £100 in £1 shares. To carry on the business of manufacturing and selling extrusions, films, mouldings in plastics or synthetic materials, etc. The first directors are: John V. Green, Somersall, Herbert Hall, Derby; Wilfred N. Green, Flower Lilies, Windley, Derby. Regd. office: Rayneway, Derby.

Howlands (Homerton) Sales Ltd. (677,550).—December 12. Capital: £5,000 in £1 shares. To carry on the business of manufacturers of and dealers in leather, canvas, plastics and rubber goods, etc. The first directors are: Alfred E. Budd and Marjorie Budd, both of 56 Chigwell Rise, Chigwell. Regd. office: 3/5 Furrow Lane, E.9.

Stephenson (Plastics) Ltd. (677,514).—December 12. Capital: £1,000 in £1 shares. To carry on the business of manufacturers and preparers of plastic materials of all kinds, etc. The first directors are: John C. Stephenson, Rose Cottage, Beoley, Redditch, (director of John Hatherill, Stephenson and Co. Ltd., etc.); Noel A. Handley, 2 Lombard Street West, West Bromwich, (director of Gresnor Holdings Ltd., etc) Regd. office: 10 Butts Road, Walsall.

Serchanda Ltd. (677,551).—December 12. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in fancy goods of all kinds, plastic, rubber, leather, vulcanite and other goods, etc. The first directors are to be appointed by the subscribers. Secretary: Shirley Hart. Regd. office: 713 Imperial House, Kingsway, W.C.2.

Intubloc Ltd. (677,619).—December 13. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastic insulating and moulding materials, substances and compositions, etc. The first directors are: Raymond H. G. Fenner, (director of Albi-Willesden Ltd.), and Margaret Fenner, both of 132 Chepstow Villas, W.11. Regd. office: Dene Court, 48 Hersham Road, Walton-on-Thames, Surrey.

Fogg and Marten Moulds Ltd. (677,671).—December 12 Capital: £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in injection and other moulds and moulding materials, etc. The permanent directors are: Frederick A. Marten, 34 Deal Road, S.W.17; Ernest S. Fogg, 75 South Street, Epsom, Surrey.

Spa Tyres Ltd. (675,891).—November 23. Capital: £2,000 in £1 shares. To carry on the business of distributors of tyres, etc. The directors are: William Joyce and Ellen P. Joyce, both of Four Acres, Yarnells Hill, Botley, Oxon. Regd. office: 198/204 Lewisham High Street, S.E.13.

The roof of this church in St. Louis, USA, is of stressed-skin plywood panels, spray coated with a vinyl formulation. This is expected to last at least 10 years with minimum maintenance

R·J·I·P· CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

CHARLES WESTON AND CO. LTD., oil sealing engineers, have a vacancy for an assistant to the rubber technologist. Applicants should be studying for an appropriate qualification with the Institute of the Rubber Industry, and facilities will be given for the continuation of part-time study. Experience of rubber compounding and physical testing is essential, and some knowledge of process control and development on synthetic rubbers desirable. The appointment will be pensionable and permanent. A 5-day 37½-hour week is operated.—Apply, stating age, present salary and details of experience to Personnel Manager, Charles Weston and Co. Ltd., Irwell Bank Works, Douglas Green, Pendleton, Salford, 6. (723)

FOREMAN required to take charge of a rapidly expanding mechanical department of a well-known rubber company in Surrey. Permanent appointment for the right man. Profit sharing and contributory pension schemes in operation.—Applications in confidence, giving full details of age, experience, and present salary to Box 715. (715)

FOREMAN required to take charge of a rapidly expanding extrusion department of a well-known rubber company in Surrey. Permanent appointment for the right man. Profit sharing and contributory pension schemes in operation.—Applications in confidence, giving full details of age, experience and present salary to Box 716. (716)

MICHELIN

require a

RUBBER TECHNOLOGIST

Who has had production management experience or who wishes to enter that field.

Candidates should be in the age range 25-35 and have a minimum technical qualification of L.I.R.I.

The position is well paid, the Company operates good pension and life assurance schemes and will provide housing assistance in certain circumstances.

This represents a first class opportunity for an energetic man to develop a rewarding career in a company whose products and standing are unparalleled.

Write to: H. A. Dilley, Ref. (970C),
Michelin Tyre Co. Ltd.,
Stoke-on-Trent,
Staffordshire.

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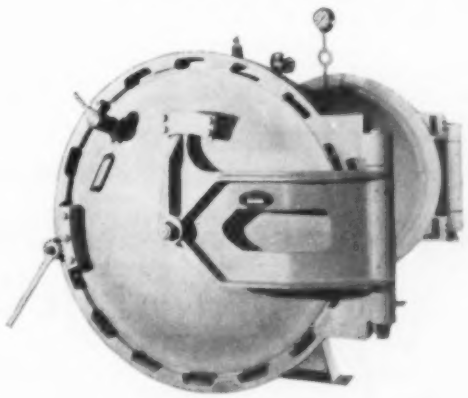

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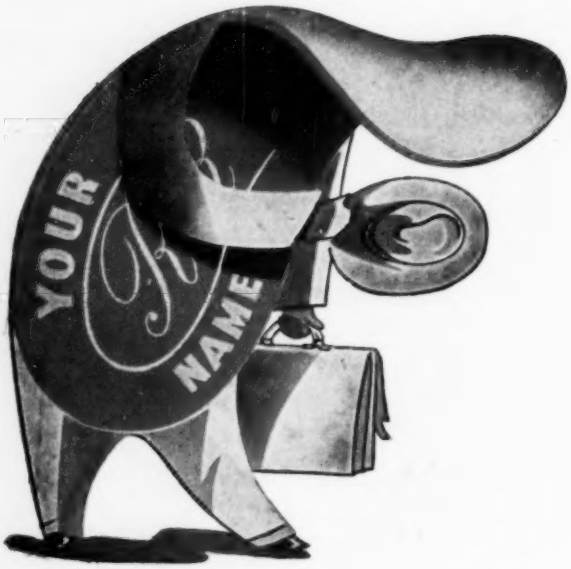

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